1084

CANADIAN

ARCHITECT AND BUILDER

VOL. XVIII —19

19[illegible]

INDEX

A

Acoustics, Architectural 38
Advertising Letters
Albany Disaster and Others 129
American Gothic Revival 131
American Institute Convention, The 18
American Plans 90
An Architects bequest for Architecture 129
Anderson, Sir Rowand. Finial 185
Angels, The Sex of 161
Antiquity of Plumbers 162
Arbitration 6-xv
Architect's Drawings 1
Architect's Suicide, An 7-xiii
Architectural Acoustics 38
Architectural Classes 158
Architecture of Concrete Building 10-xii
Art and Advertising at the Torooto Fair 130
Artificial Stone Colouring 8-x
Atelier at Columbia University 65
Avenue of Sod, an 49
Axial Planning 108

B

Bad Gas Fitting 10-ii
Baltimore Fire, Lessons from the 3
BOOKS:
Architect Owner and Builder before the Law, by T. M. Clark, F.A.I.A. 162
Concrete, Plain and Reinforced, by Frederick W. Taylor, M.E., and Sandford E. Thomson 85
Columbia University School of Architecture, Year Book 141
Easy Lessons in the Art of Practical Wood-carving, by Fred T. Hodgson 85
Ferric and Heliographic Processes, by George E. Brown, F.L.C. 53
(A) Handbook for Superintendents, Architects, etc., by H. G. Richey 36
(A) History of Architecture, by Prof. Banister Fletcher and Banister F. Fletcher 36
Marsh's Reinforced Concrete 36
Natural Ventilation 130
Plank Frame Barn Construction, by John L. Shawver 53
Properties of Steel Sections, by John C. Sample 70
Sanitation of a Country House, The, by Dr. Harvey B. Bashore 118
Book-Keeping from the Master Painter's Standpoint 142
Boycotting, Decision Against 4-ix
Brick House Floated 5-x
Brig of Ayr, The 145
British Columbia Plumbers Organize 78
Broken Brick, a use for 60
Builder's Exchange, Winnipeg 11-ix
Building Materials, Waste in 13
Building of the Barn, From the 13
Builders' Organization, A 34
Building Stone, Tests for 12-xvi
Business Notes No. 1-xiv, 19, 32, No. 2-ix, No. 2-xi, No. 2-xiii, 3-xiii, 4-ix, 10-xi, 10-xiii
Burke Edmund, Notes of a Flying Trip to 71
By the Way 101
Bronzing Iron

C

Campanile, The, Venice 57
Canadian Cathedral, A 7-xiv
Canadian Clayworkers' Convention 12-ix
Canadian Co., to make Fire Appliances 52
Canadian White Company 8-xv
Carnegie, (Mr.) Entertained by Builders 55
Carpenter(s) Driving a Nail 133
Cement Blocks 34
Central Heating 61-xii
Churches, Skyscraper 87
Chicago Foundations 153
Civic Act Pays 54
Clayworkers' Canadian Convention 12-ix
Cleveland Builders' Exchange Outing 126
Colonial Contracts 79
Colouring of Concrete 41
Columbia University, Atelier at 65
Combines and the Law 102
Common Defects in Existing Buildings 137
Competition (C.A.&B.) for Students 146
(The) Competition for the Public Library at Toronto 163
Competitions, P.Q.A.A., Code for 17
Competitive Prize Essays on Hydraulic Cements 6-x
Concrete Blocks that defy Detection 99
Concrete Building in Liverpool 170
Concrete, Colouring of 41
Concrete Construction and Consistency in Reinforcement 106
Concrete Cottages in Liverpool 7-xiv
Concrete, Proportioning Sand and Cement for 9-xiv
Concrete, The Growing use of 12-xvi
Construction, A new Process 186
Convocation Hall, University of Toronto, Site for 66
Correspondence—Engineers as Fire Chiefs No. 1-ix from J. S. Archibald, Pres. P.Q.A.A. 183
from W. H. Lynes, Sec. Plasterers' Association 183
Cost of Buildings, The No. 2-ix
Costly Public Buildings 170
Cottages, Free Plans for 81
Crane, Walter, on House Decoration 12-xiii
Curing Concrete Blocks 121

D

Danger in Alterations
Decoration, Note on
Dow Panels 11-iii
Development of an Estate, The 51
Devil's Door, The 79
Door, a Novel Balanced 105
Drawing at the Eighteen Club Exhibition 19
Drying Plaster in Winter 145
Damages for Non-Completion of Contract
Durability

Eighteen Club Exhibition, Drawing at the 19
Electricity, Household uses for No. 2-xiv
EXHIBITIONS
British Manufacturers 12-viii
Eighteen Club 2
Royal Canadian Academy 78
Society of Applied Art 179
Extended Surfaces for Cooling 3-xii

F

Fatuity of the Small House Lot 10-iii
Finial by Sir Rowand Anderson 185
Fire Clay in Nova Scotia 145
Fire Waste, The No. 2-xii
Free Plans for Cottages 81
French Polish 11-ii
Frozen Mortar 49
Forfeiture Clauses in Building Contracts 44

G

Garden Cities and Suburbs 115
Garden Front, The 83
Gas as a Fuel for Hot Air Heating 43
Gas, Dunge's from 59
German Strike affects Canada No. 2-xiii
Gibbon V. Pease 59
Glass Buildings 12-viii
Glass, Old 6-xiii
Good School Design 97
Gray, Major Henry, Biographical Notice 70
Grand Central Station, New York, The new 99
Greenhouse, Steam Radiation in a 11-xii

H

Hamilton Art School 25
Hamilton Convention of Master Painters and Decorators, The 84
Hardwood Supplies in the United States 8-xiii
Heating and dust 10-ix
Heating Apparatus and Bad Odors 111
High Building, To Control the Effect of 114
High Structures, A Few 62
Hopkins, The Late J. W. 178
Hot Air Explosions, Prevention of 6
House Mottoes 145
House Problem in Montreal, The No. 2-xiii
How to Cool a Cellar 11-iv
How Would You Like it 8-xiv
Humidity in Heated Houses 88

LIBRARY
738103
UNIVERSITY OF TORONTO
NA
1
C3
V.18-19

INDEX—Continued

Ideal House, The 57
Ignition by Sun 4-xi
Inclined Elevator, The 10-iii
Indestructible Houses 9-xii, 11-x
Industrial Accidents No. 2-x
In Praise of Architects 7-xii
Inspect Fire Appliances when Installed 6 ix
Insurance Institute of Toronto 7
International Congress (Seventh) of Architects 12-xii
Investigations for the Improved use of Concrete 86
It pays to Employ a Reputable Architect 75
Intercommunication, 10, 24, 42, 58, 74, 90, 106, 122, 138, 154, 171, 186

K

Kidder, The late Mr. F. E. 10
Kitchen Ventilation 4-xii
Kyanizing Co., The, re measurements and Prices, their relation to the Master Painter 73

L

Labour and the Open Shops 149
Labour Case Ended 9-xi
Laying Concrete, New Method 4-x
Leak Radiator, The 63
Lewis & Clark Exposition, The 5-xiii
Legal No. 12-ix, 9-ix
Lessons from the Baltimore Fire iii
Lewis or Chains No. 1-xiii
Licensing Architects 6-xii
Life of a Sky Scraper, The 99
Lightning Research 86
Lockout as Lawful as Strike 10-x
London Builders' Exchange 3-x

M

[illegible] 146
Marsh's Reinforced Concrete 35
Master Plumbers Association of Ont., Annual Convention 62
McCausland, Mr. Joseph, biographical Notice 70
[illegible] of Architecture
[illegible] 158
Master Painter 73
Mechanics' Lien for Wages in British Columbia 6-xiv
(The) Metallic Roofing Co. Case Concluded 161
Montreal Architectural Club
Montreal Builders' Exchange re Annual Dinner 31
Montreal, Building Boom in 166
Montreal Building By-Law, The 77
Montreal, Building in
Montreal Carpenters' Strike
Montreal Notes 45, 61, 93, 108, 125, 141, 157, 173, 189
Montreal, Real Estate in 61
[illegible]
Monument to Canadians who fell in South Africa
Municipal Lodging House, A 3-ix
Municipal Testing Plants 113

N

New Building Laws and Old Buildings 98
New Grand Central Station, New York 90
New Trinity Building, The 116
New Pavilion for Toronto 31
New Post office at Toronto 31
New Style of Stove, A 95
No Plasterers Combine in London 12-xii
Nobbs, Prof. P. S., Address on Value of Study of Old Work 74
Notes of Flying trip to Washington 71
Novel Balanced Door, A 115
Novelty in Laying Concrete, A 108

O

Obituary Notices:—Tully, Kivas, 68; McCausland, Joseph, 70; Gray, Major Henry, 70; Simmons, Wm., 6-xii; Warwick, John D., 6-xii; Kidder, F. E., 161; Hopkins J. W. 178
Old Glass 6-xiii
One Hundred and Twenty-Five Storey Structure No. 2-x
Ontario Clayworkers' Association 15
Open Shop Movement in America, The No. 1-xi
Ornamental Trolley Poles 147
Our Homes to Warm 57
Our Sinful Extravagance 158
Overhead Signs and Telephone Poles 98
Overhead Tanks 49
Oxford Art Lectures 8-xi

P

Painters' and Decorators' Association of St. John, N. B. 3-ix
Painting New Woodwork 14-iv
Paints, rProtective Power of 14
[illegible] for Rural Homes
Personal 16, 32, 46, 5-x, 96, 128, 144, 160, 176
Personal Transportation in Factories 9-x
Peterboro' Plumbing Inspection 3-ix
Pickling Steel No. 2-ix
Pink a Restful Colour 9
Plan for Toronto, A 33
Planning of Decorations, The 167
Plaster, Drying in Winter 145
Plastering in Winter 151
Plumbers Apprentices 10-iii
Plumbers' Combine, The 178
Porosity and frost Resistance of Bricks 11-xiv
Posters and Dodgers 50
P.Q.A.A., Code for Competitions 17
Preventing Frost on Show Windows 137
Prevention of hot air Explosions 6
Preservation of Stone 15
Profitable Treatment of Sewages 95
Proportioning Sand and Cement for Concrete 9-xiv
Protective Power of Paints 14
Providing for Additions 23
Provincial Association of Builders, A 1
Province of Quebec Association of Architects, Annual General Meeting 26
Pulp Refuse as Fuel 10-xi

R

Radiation from radiators 80
Radiation, Direct, The 65
Restriction of Working Hours unconstitutional 5-xv
Retroactivity in building laws 6-ix
Richardson's building at Pittsburg 4 x
Rosedale Association, The 82
Rowton houses, The 95
Royal Canadian Academy Exhibition 78
Rules for the testing of new material in construction 119
Russell Chas. W. Paper on Modern Methods of financing building operations 56
Reinforced Concrete Roundhouse, Toronto 124
Relative Cost of Brick and Glass 12

S

Sand-blast cleaning 97
Sand-lime brick 119
Sanitariness of beauty, The 81
School building 102
School design, good 97
Scientific choosing of Wall Paper 3-ix
Seventh International Congress of Architects 18
Sewage, Profitable treatment of 95
Simmons, Mr. William 6-xii
Simplification of Plumbing, The 10
Simpson, John W., Paper on Cleaning of Streets and Public Spaces 26
Sketch Club, P.Q.A.A. 117, 174, 187
Sky scraper churches 87
Sky scrapers in Germany 5-ix
[illegible] 99
Steam radiation in a greenhouse 11 xii
Steel Radiators No. 2-ix
[illegible] 109
Stone Preservation of 15
Students' Competition Awards 73
Suicide, An Architect's 7-xiii
[illegible] Association of America
[illegible]

T

Taking pains to come under a boycott 113
Tall buildings, The blank side of 116
Tall buildings, Vitiated air in 98
Tariff on Plans, The 164
Tar paper at Sault Ste. Marie 5-xiv
Telephone Poles off the Streets 177
Testing a reinforced concrete factory 9-xv
Tests for Building Stone 12-xvi
The Am. Inst. of Archts. What it is 3-ix
The blank side of tall buildings 116
The Day's Work (Verse) 121
The Noblest Art 8-xiv
The Sanitation of Muskoka 113
The Street traffic in London 10-xiv
The suburban home 10-iii
Time proof 8-ix
Toad in a brick 12-xvi
To bring fresh air to London 11-xiii
To control the effect of high building 114
Toronto Beaux Arts Club, The 7
Toronto Builders' Exchange 3-x
Toronto Builders' Exchange Notes 3-x
Toronto Chapter O.A.A. 146
Trees and lightning 10-xv
Tully, Mr. Kivas, biographical notice 68
Turner C. A.—Address on Reinforced Concrete 42
Toronto Builders Exchange 12

U

Underground Municipal Structures 13
Underwriter's view of some failures of construction 94
Union money not attachable 3-ix
University of Ottawa, new building 60
Utilization of Sky scraper roofs 93

V

Vacuum Cleaning 17
Very modern building, a 87

W

Waterhouse, The late Mr. Alfred 129
War on race suicide landlords 10-iii
Warwick, Mr. John D. 6-xii
What I want in my house 134
White lead Duty on 148
Why Brick Construction is Costly 5-xi
Winnipeg Builder's Exchange No 1-ix
Winnipeg Notes 3-xi
Winnipeg, The T. Eaton's Store at 112
Wire wound wooden pipe No. 2-xi
Wrecking the World's Fair 166

ILLUSTRATIONS.

The page numbers after the illustrations refer to the descriptions in the text. The illustrations should be bound up with the same number.

Apartment Bldg., Bishops Court—Saxe & Archi[illegible]
[illegible] Edmonton—Darling & Pearson, Architects, Toronto 133
Bank, Royal, Branch on St. Catherine St. Montreal—Edward and W. S. Maxwell, Architects, Montreal 165
Bank, Traders—Carrere & Hastings, New York, and F. S. Baker, Toronto, Associated Architects 165
Blackwell's Island Bridge, New York—Palmer & Hornbostel, Architects, New York 19

Cheap Cottages 37, 117, 133, 149
Choir Stalls by C. A. Voysey 181
Church of St. Augustine, Pittsburg—Rutan & Russell, Architects, Pittsburg 37
Church at Cohasset—Cram, Goodhue & Ferguson, Architects, Boston 19
Church of St. Mary, Portage La Prairie—H. S. Griffiths, Architect, Winnipeg 53
Church of St. Mary, Toronto—The late Joseph Connolly, R.C.A. Toronto, Architect 181
Church of St. Peter and St. Paul, Fall River, Mass.—Cram, Goodhue & Ferguson, Architects 69
Concrete House for Mr. C. A. Matchoun 89
Cottage in Victoria—S. Maclure, Architect, Victoria 53
[illegible]
[illegible]
Symons & Rae, Architects, Toronto 7

Hall and Living Room, Residence of Vax[illegible]
House of J. W. Siddall, Architect, Toronto 33
House for Mr. J. H. Chambers, Winnipeg—E. & C. Evans, Architect, Winnipeg 37
[illegible] St. Gabriel St., Montreal—Drawn by Cecil S. Burgess, A.R.I.B.A., Montreal 101
House in Victoria—S. Maclure, Architect, Victoria 53
Houses for Wage Earners in Washington 181

[illegible] Soldiers who fell in South Africa—W. S. Allward, Sculptor, Toronto 8

No. 17 Elm Ave., Toronto—Chadwick & Beckett, Architects, Toronto 69
No. 152 Park Road, Rosedale, Toronto—Burke & Horwood, Architects, Toronto 8
No. 300 Wilbrod St., Ottawa: Main Stair, Hall, 85; Drawing Room Library, 133; J. W. H. Watts, Architect, Toronto.

Public Comfort Station, Hamilton—Jas Balfour, Architect, Hamilton 8

Students Competition: First Prize, W. B. Van-Egmond, Toronto; Second Prize, S. Douglas Ritchie, Montreal 23
Warehouses, Bay St. Toronto 101

Yacht Club, Toronto—Sproatt & Rolph, Architects, Toronto 117

ILLUSTRATIONS IN TEXT.

Construction, A New Process—Cuts 187-188
Cottages at Lincoln Mass. 37
Cottage in Lancashire, England 109

Doolittle & Wilcox Quarry Dundas, View 110; Screen building 111; General view 111

Final by Sir Rowland Anderson 185

House at Outremont 126
House in Arlington Ave., Montreal 125
House in the Cote St. Antoine Rd., Westmount 125
House in Roslyn Ave., Westmount 126
Houses at Verennes 108

Old house in Sherbrooke Street, Montreal 109
Old house, St. Urban Street, Montreal 109

Portrait of Mr. John S. Archibald, President of P.Q.A.A. 27
Portrait of the late Major Henry Grey 70
Portrait of the late Mr. Joseph McCausland 70

The Beginning of Things (Log house) 108

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY, PUBLISHERS.
W. A. LANGTON, EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 205. JANUARY, 1905.

ILLUSTRATIONS ON SHEETS.

Grant Hall, Queen's University, Kingston.—Symons & Rae, Architects, Toronto.
No. 152 Park Road, Rosedale.—Burke & Horwood, Architects, Toronto.
Hall, No. 123 St. George Street, Toronto.—Burke & Horwood, Architects, Toronto.
Public Comfort Station, Market Square, Hamilton.—James Balfour, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Statue of Queen Victoria.—George Frampton, R. A., Sculptor.
Memorial to Canadians who fell in the war in South Africa.—W. S. Allward, Sculptor, Toronto.

CONTENTS

Editorial 1
Eighteen Club Exhibition 2
Lessons from the Baltimore Fire 3-4-5
Prevention of Hot Air Explosions 6
The Toronto Board Art Club 7
[illegible] 7-8
Montreal Notes 9
Pink a Restful Color 9
The Building of the Barn 13
Underground Municipal Structures 13
Protective Power of Paints 14
Preservation of Stone 15
[illegible] 15
Correspondence 18
The British Fire Prevention Committee x
The Open Shop Movement in America xi
Cement Blocks xii

The recent annual meeting of the Toronto Builders Exchange placed itself on record as being in favour of the formation of a Central or Provincial Association. This is the best way to secure concerted action, and concerted action is necessary now-a-days.

Architects' Drawings.

The vexed question of who owns an architect's drawings is about to be settled for Englishmen by an appeal from the decision in the case of Gibbon v. Pease. This suit by a client, for the possession of the drawings upon the conclusion of the work, was decided in favor of the client, Gibbon, on the precedent of a case, Ebdy v. McGowan, in which an architect, suing for 2½ per cent. on work not carried out, was obliged to give up his drawings as a condition of getting the fee. The situation in Gibbon v. Pease is different, for here the work was completed. The client got his building to his satisfaction, but demanded the drawings too. The judge declined to hear the evidence of architects on the side of the defendant; saying that the case was settled by the judgment in Ebdy v. McGowan.

The weak point in the case, on the side of architects, is the custom, acquiesced in apparently by the profession, that, when a building is not carried out, the drawings should be given up, in order that the client may have something for his money. The client has as a matter of fact got something for his money. He has got accurate knowledge of how much it would cost him to build. If it is this knowledge which causes him to desist from his purpose, its value to him is measured by the extent to which he saves himself from embarrassment by so desisting. He has probably got the worth of his money.

The proposal to give him drawings, in order to give him money's worth, brings out clearly, what the courts seem to find it so hard to understand, the real nature of an architect's drawings; that is to say the fact that they are not an end in themselves, and have no use in themselves apart from their end, which is the erection of a building. The building is the end. This is what the owner invites the architect to produce for him, and its production is what he pays the architect for. One stage in the production of a building is the estimation of its cost. For this, if the owner pays a fee, he gets in return the knowledge which he wants and which is therefore of value to him. What further value does he get by having the drawings handed over to him? None whatever (they are not works of art), none whatever—*unless he means to use them to produce a house.* It is the client's right to *use* the drawings which is granted when he is given possession of them. This is the implication and in the implication is implied a recognition of the true nature of an architect's drawings—that they are but means to the production of a building.

But has the client a right to use an architect's drawings apart from the architect and against the wishes of the ar-

chitect? Is the law then to be invoked to enable clients to cheat their architects; to enable anyone, who has once deceived an architect into making drawings for the purpose of erecting a house, to bone the drawings and walk off with them, under the protection of the police? If the entire profession cries out upon this as an unbearable situation, there is surely something in what lawyers call the 'logic of the case' that deserves to be considered by the judges who have to decide this appeal. There is a phase of the injury that might be readjusted by a change in the scale of fees, taking account of occasions when an architect is willing to supply drawings only, for a fee suited to this condition; but the essence of the matter is deeper than this. As H. H. Richardson used to say, architecture is a plastic art; it is not possible to attain perfection in its execution merely by making drawings; the mental attitude of the best men towards their work is that of a sculptor towards his conception,* and, if it were possible to conceive of a state of affairs in wh ch architects were prohibited from dealing with anything but drawings, such a state of affairs would mean that the profession would degenerate, until the architect, as we understand him at present, would cease to exist. The function of the profession in this case, would not be large enough for a man like Richardson. There is no question but that, difficult as as it may be for the man of business to understand it, drawings are not the end for which an architect offers his services or for which, properly

But, so long as [illegible] is wanting, it is well for architects to remember that custom and precedent rule in a court of law only in the absence of definite contract; and if any one wishes to retain possession of his drawings under all circumstances it is only necessary for him to express this wish to his client, in the beginning of their connection; either by a clause in his schedule of fees, or by letter, or even by word of mouth which is witnessed or provable.

Site for Monument to Canadians who fell in South Africa.

The only site suggested as yet for this memorial is the junction of Queen Street and Spadina Avenue. This seems far down town and yet not in the centre of life. There is danger of the monument being swamped by warehouses which, apart from the depressing influence of their scale upon a refined piece of work like this memorial, imply a neighbourhood where it would be little seen. The warehouse district is a dull district. It is desirable to keep away from it, and as, in Toronto, this district, as it grows, must back up town because of the lake, it is wise to keep well up town in choosing a site for this monument.

The natural background, for anything of a classic character in white stone, is a mass of foliage; and, in the case of this particular monument, the long vertical lines would compose well with the rounded forms of trees. The avenue or park seem for this reason to be indicated, and should form the ground of an alternative proposal. Indeed the avenue is particularly adapted to give a full view of a lofty monument; and its own effect would be greatly enhanced if such an object closed its vista. But in this case it would be necessary to move to some other site the bronze statue of Sir John Macdonald, which, as compared, in colour and size, with this memorial, occupies, in a futile manner, the effective position in the vista. Another appropriate site is that occupied by the band stand in the centre of the park. This is, however, rooted to the ground by drains from the lavatories underneath it.

There are in fact no sites pressing to be filled that are not filled. We must look about for a site. If we look not only about but ahead, it will be seen that this monument is the very thing we want for the diagonal avenue that is to be cut from Queen Street to the north-west part of the city. The monument needs a conspicuous site with a length of open approach on either side of it. The avenue needs a conspicuous object to interrupt its vista and give value to its extent of view. The monument wants an island to stand on and the avenue, being yet undefined, affords an opportunity for making it exactly as required; and itself needs a motive of this kind to vary its line. It will take some time to complete the monument, and in the meantime the plan of the avenue, which, with other improvements to Toronto, is in the air and is coming, may be fixed; and the establishment of a site for the monument on its course will be an encouraging [illegible] affected. That is [illegible] site until the work is done and it is necessary to set it up. By then the place for it to fill may be more obvious.

* (Compare the proposal of the President of the American Institute of Architects to study the alterations in the front of the capitol at Washington by means of a full size model in staff.)

EIGHTEEN CLUB EXHIBITION.

The annual exhibition of the Eighteen Club of Toronto will be held in the gallery of the Ontario Society of Artists, 165 King St. W. from January 28th to February 11th. There will be a number of drawings by architects of New York and Philadelphia. Among these are 8 drawings by Mr. Wilson Eyre, 3 by Messrs. Butler & Rodman, 5 drawings of the Ansonia Hotel by Messrs. Duboy & Jellate, and Messrs. Stonghton & Stonghton's drawings for the Soldiers and Sailors Monument. There are also 6 water colour drawings by Messrs. Renwick, Aspinwall & Owen, 12 sketches made in Italy by Mr. Birch B. Long, some landscapes by Mr. D. F. Pentecost, and 35 drawings by Messrs. Talmer & Hornbostel which are intended to be sent later to the Paris Salon.

The gallery will be open to the public during the day without charge, throughout the exhibition.

The Club will give a smoking Concert on an evening not yet fixed.

A new saviour of his country has arisen in the United States in the person of Mr. Edmund Beall, of Alton, Ill., who has built a row of flats, which he calls 'The Stork's Nest,' and announces that he wants as tenants none but married couples with plenty of children. He does not absolutely bar bachelors and spinsters from renting rooms in his building, but declares that it is useless for them to take them if they object to children. As a consequence, it is said, a dozen cities have sent to Mr. Beall invitations to invest his capital with them.

LESSONS FROM THE BALTIMORE FIRE.

SECOND ARTICLE.

HOW FIRE ATTACKS.

Explosion.—The first warning of the Baltimore fire was an automatic alarm from the basement of the Hurst Building to a station two blocks away. No fire was visible above the basement when the firemen got there, and no smoke or heat was apparent; but they found fire in the basement which increased rapidly and spread up the shaft of the passenger elevator. In seven minutes from the time the automatic alarm registered there was a violent explosion, apparently coming from the upper floors. This blew out the windows of the Hurst building, and many others in neighboring buildings. In a moment the entire building was seen to be ablaze. Flames came from all the windows and, extending across the street, "ignited several buildings."

The occupants of the building say that there was no gasoline in it, and, though the building was piped for gas, there was none used. "The most plausible theory," according to the Special Committee of the National Fire Protection Association, "is that the smoke and gases from a smouldering fire ascended the central elevator and stair opening, accumulated in the upper portion of the building, and were finally exploded when reached by the flames." Prof. Norton says it is well known that "the products of distillation in a slow fire smouldering for some time before becoming rapid in its spread may, when united with air, become explosive." The contact of air with this smoky mixture causes an explosion known to the firemen as a "hot [illegible] fire to produce gas sufficient for such an explosion—that Mr. Sachs says a first alarm was sounded twenty five minutes before the alarm which brought the firemen to the spot.

However that may be, or whatever the cause of the explosion, the immediate cause why the fire extended beyond the Hurst building, and why, when it did spread, it ignited several buildings at once—was explosion.

For this reason Mr. Sachs makes municipal limitation of the storage of highly inflammable or explosive substances one of the lessons to be derived from the fire. (There was indeed within twenty minutes after the firemen got there an explosion of gunpowder—60 pounds in a safe—at a hardware store across the way.) This, as well as 'Mr. Sachs' other connected proposition—that there should be a means of cutting off at short notice the gas, water and electric supply to blocks of buildings—is a civic matter, rather than a matter that concerns architectural practice, and is more easily dealt with than the mystery of explosive gases generated during the progress of the fire. Prof. Norton considers that sprinklers and ventilation and stops in vertical openings tend to minimize the danger from explosions of this kind. But a safe blow-off vertically seems safer, as an additional precaution, than to have the building so tightly closed up that, if the worst comes to the worst, it should be necessary for the exploded gases to find vent by breaking the windows and blowing the flames across the street to inlets into other buildings by means of broken windows provided by the same explosion. The provision, among the Conclusions of the National Fire Protective Association's Committee, that stairs and elevators shall be enclosed in brick walled shafts, with fire doors at the storey openings, and extending through the roof with a thin glass skylight at top, seems to partly meet this provision. That is to say, as far as it is necessary to leave a skylight of weak resistance at the head of the stair and elevator well, for the chance of communication being established between the building and this channel, so far the well may become a channel for the outlet of explosive gases. It would be met at the cost of leaving one vulnerable spot in every roof, at the thin glass skylight. This is, however, not properly an entrance to the floor area of the building, but only to a fire-proof tube which runs past the floors.

Ordinary Modes of Attack.—If not "violently scattered as by an explosion," Prof. Norton says, "fire spreads through a district by the carrying of sparks, by the direct contact of flame, and by radiation across open-spaces." Protection against these dangers involves, besides considerations of material already spoken of, considerations of planning and construction which, as expressed in the reports under review, are here brought together under the head of

PROTECTION CONSTRUCTION.—EXTERIOR.

Openings.—It is obvious that all surfaces must be equally fire resisting if fire is to be kept out of a building. For this purpose (considered alone) all openings should be as small as possible. The monumental buildings exposed to the fire—the Court House and City Hall, "heavy stone buildings with comparatively few open-[illegible]

[illegible] from the spalling of the stone and charring of window frames. The fire was not driven towards these buildings [illegible] the steel-frame buildings, but there was sufficient exposure to "demonstrate the effectiveness of a minimum window area in reducing the danger of ignition.

But the conditions are usually not a minimum of light, but a maximum. Then there must be adequate protection, and the question is what is adequate. There are three modes of protection:—Wired glass, shutters and the water curtain; which latter must be taken into account, as, though not constructional, it modifies the occasion for construction. Does a building with a water curtain require also wired glass and fireproof shutters? If the water curtain is sure to work and to work as long as it is wanted, there is strong evidence in favor of its effectiveness to be extracted from occurrences in the Toronto fire; but where it is not supplied from a separate service, as it is proposed to do in London and New York, the Toronto fire also affords warning that, in a conflagration, draughts on the pressure of the water system are so great that water may fail to reach the height necessary to supply the water curtain of a high building. In any case wired glass and shutters have a function to keep fire in as well as out. They have the pressure of heat and perhaps of explosion to withstand. It may be possible to make a path of least resistance towards the sky for the issue of explosive gases, but hardly, one would think unless the windows are prepared for a greater resistance. There must clearly be constructional protection for windows as well as the protection of a water curtain.

The available means is wired glass set in metal frames. But wired glass did not stand in all cases in the Baltimore fire. The melting point of glass was reached. Capt. Sewell "saw a good deal of melted glass" and the investigating committee of the National Fire Protection Association report that "wired glass melted in a number of instances."

For perfect protection it is necessary to supplement wired glass with shutters perfectly made. Of "tinned and sheet-iron shutters" Prof. Norton reports that "few or none withstood the enormous volume of flame and hot gases." The shutters themselves, of whatever kind, would probably be a loss. Metal shutters, hung in the ordinary way, Capt. Sewell condemns because they "warp and twist and then they do not fit closely enough." "Wooden shutters covered with sheet metal would probably do no better, because the wood would char by destructive distillation and destroy the hold of the screws or other means used for fastening on the hardware. But, if carefully made, shutters would probably prevent the fire from entering the building. Capt. Sewell suggests rolling shutters because, being hung from the top, they "suffer none but tensile stresses when hot." Shutters of this kind at Baltimore, "made up of several sheets of light, corrugated iron rivetted together along horizontal lines," were too light. "Probably," he thinks, "a rolling shutter made of heavy interlocking slats, or slats fastened together with heavy links, would be better. Still better would be one or two sheets of metal stiffened round the edges, properly hung, and sliding in the window-[illegible] along the shutters [illegible] to cover the opening; but, with walls of proper thickness, it could readily be provided. That part of the frame carrying the shutters should be of metal and pocketed into the brickwork, with a little room for expansion."

[illegible] advantage to any window opening, and dangerous if they carry weights. Capt. Sewell says:—"It is much better to have all window openings single, and no light piers of any sort in the outer walls, whether they are classed as mullions or not."

SPANDREL BEAMS.—Intimately connected with the defence of openings is the protection of the beams which carry the curtain wall from storey to storey and make another series of vulnerable points on the exterior. The safety of the window frames affects their safety, and the expansion of cast iron mullions attached to these beams, when running over large windows, caused many in the Baltimore fire to fail and upset a portion of the wall they carried.

Spandrel beams should have a clear carry, with no destructible mullions or light piers between the windows below; and the fire protection of the beams should be adequate i. e. should (as defined in portions of the reports reviewed last month as referring to materials) be thick enough not to heat the exposed flange through and so make a breaking strain at its junction with the cool and unexpanded web.

CONTINUOUS EXTERIOR WALLS.—Capt. Sewell suggests a more thorough way of avoiding this source of danger. He says:—"The exterior walls of many of the so-called fire-proof buildings ought to be taken down; all of them are more seriously damaged than appears, except upon close inspection. I believe better results would be obtained by building the exterior walls continuously from the foundation up, anchoring them carefully to the steel frame to prevent buckling. The beams carrying the walls are often so near the surface, especially when they act as lintels, that in long-continued fire they get hot enough to expand and bend; this will wreck the wall if nothing else does. If the weight of brickwork is assumed at 125 lb. per cub. ft., and its safe-working load at 20 tons per sq. ft., a wall of uniform thickness and 320 ft. high will be safe under its own weight as far as crushing is concerned. With a very moderate increase of thickness near the bottom, and thorough anchorage to the steel frame at all points, a self-supporting brick wall is entirely practicable for any steel-frame building. Its only drawback is the time required to build it, for it could not be started on a number of levels at the same time. This, however, would probably result in better work. The modern building erected in record-breaking time, is never a model of workmanship, and often it contains defects that reduce the factor of safety almost to unity. The standard of work that prevails in these hastily-erected structures would not be tolerated for a moment in general engineering works."

FIRE-WALLS.—Mr. Sachs alludes with satisfaction to the "appreciation of the party-wall question" in London as one reason for thinking such a fire as the Baltimore fire unlikely to occur in London.

ROOFS.—Capt. Sewell says:—"So far as I was able to determine, both slate and tile roofs kept out the fire, [illegible] damage to themselves." He adds [illegible] finish."

INTERIOR.

LIMITATION OF FLOOR AREAS.—BRICK PARTITIONS.

The Committee of the National Fire Protection Association says:—"The large areas now so common, and particularly in those buildings having unenclosed [illegible] openings, [illegible] render even the most approved methods of fire-resistive construction now in use of doubtful value." It concludes:—"Buildings of considerable area and having large quantities of combustible contents should be subdivided by substantial brick fire walls sufficient to form a positive barrier to the spread of fire." There is no getting away from the conclusion of all the reports that the only proper material for this purpose is brick. Capt. Sewell says:—"The only successful partitions were brick walls. All other partitions of all sorts were a total failure." The other reports are as strong.

The brick wall should be well founded. There seems to be no certainty of stability short of a foundation on the ground.

VERTICAL OPENINGS ENCLOSED.—The Committee of the National Fire Protection Association is strong on this point. They say:—"Vertical openings extending throughout buildings, as for stairs and elevators, rapidly communicate fire to all storeys. With buildings of considerable height or combustible contents this is likely to result in fire conditions beyond Fire Department control. All such floor openings should be enclosed in brick walled shafts, crowned by a thin glass skylight and extending through the roof, and with fire doors at openings to storeys.

The report appeals for the protection of openings in buildings of ordinary construction as well as in those of fire-resistive construction. It thinks also that existing buildings should be altered to meet this requirement and that municipal building laws and insurance discrimination should be evoked to this end.

STAIR CONSTRUCTION.—The Committee of the National Fire Protection Association makes the conclusion:—"Stair treads should preferably be of iron or its equivalent. If slate or marble treads are used they should be supported by a metal plate underneath. Where slate or marble has been used in the Baltimore buildings it was the rule to find the entire stair treads and landings gone. It is very important to make the stairway safe for use by firemen after it has been exposed to heat.

Prof. Norton says:—"Cast-iron stair frames and rails stood remarkably well in most instances.

DESIGN OF COLUMNS.—The Committee of the National Fire Protection Association concludes:—"To resist distortion, steel columns should be designed so as to practically equalize the transverse strength of the material in all directions from the axis of the column."

The behaviour of two steel columns in the fire illustrates this. The box column shown in Fig. 1, having lost its fire protective covering, buckled thus, but maintained its vertical position. The result was a settlement of about 4 inches in the floor above. A column in another building, (Fig. 2) which was made of channel irons and was [illegible] susceptible of buckling in [illegible] shape of the letter S and brought down the roof.

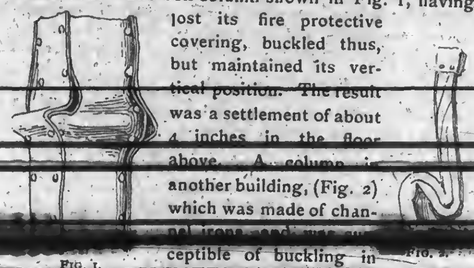


FIG. 1.

STRUCTURAL METAL WORK SHOULD BE PROTECTED.—The Committee of the National Fire Protection Association says:—"The practice of leaving steel-work unprotected in blind attics has prevailed to some extent in the past, although its fallacy has been frequently demonstrated." Unprotected cast iron columns in the basement and on the ground floor caused the collapse of the National Mechanics Bank Building in Baltimore.

FLOORING.—The committee of the National Fire Protection Association says:—"The desirability of minimizing the amount of combustible material in floors was very clearly demonstrated in this fire, the wood floors and nailing strips being practically all consumed." The committee therefore concludes: "Floor surfaces should be of non-combustible material."

TRIM.—Capt. Sewell's definition of a fireproof building includes "incombustible trim."

PIPES IN COLUMN COVERINGS.—Pipes and conduits running inside of the protective covering of columns have been accused of buckling and thus causing the failure of the column covering. Capt. Sewell finds more evidence in favor of the column covering having failed first, but admits that the subsequent buckling of the pipes inside must have aggravated the failure of the covering.

In any case one would think there is danger in this practice because of the admission of a second set of workmen, who have no responsibility for the proper covering of columns, to place work behind it, not only while the building is in progress, but, in case of alterations and repairs, afterwards, when a rupture of the completeness of the fireproofing may be imperfectly restored.

THE VALUE OF FIREPROOFING.

Capt. Sewell estimates the cost of repairs to the fireproof buildings injured in the Baltimore fire, as not less than 60 per cent. of their original value. He calculates further that if all the improvements in fireproofing were introduced at once, they would increase the cost of fireproof buildings about 15 per cent. This additional cost does not, of course, guarantee against repairs, more or less costly, in case of exposure to fire. It is not possible to construct a building that will not be damaged by fire. A fire outside may be kept from entering the building, but at the cost of damage to wall surfaces, destruction of architectural finish, and probably such injury to the window shutters that they would have to be renewed. A fire inside may burn itself out without much injury to the actual structure but everything in the way of finish, whether combustible or not, would disappear. The Committee of the National Fire Protection Association calculates on the destruction in a fire of "all ornamentation, such as marble, metal grill work, plaster, and other less durable materials. "In brief" they say "it may be expected that, in fires of great severity, the steel frame, its protective coverings, the walls and floor arches alone will remain, and even these will be more or less damaged according to the character of the construction and materials used."

[illegible] reconstruction, in case of fire, [illegible] precautions in building. Capt. Sewell's tabulated estimate of the cost of restoring the fireproof buildings at Baltimore will give some basis for calculation. His estimate (including the cost of removing debris) is as follows:

	Per cent.
Steel frame	10
Outer walls	50
Floor systems	50
Partitions	90
Column coverings	100
Mechanical equipment	100
Trim and finish	100
Office furniture	100
Contents of vaults	25

If the steel frame can be completely protected and the 10 per cent. estimate of moderate damage applied to the outer walls, floor systems, partitions and column coverings (made fire resisting by the additional expenditure proposed), the percentage of cost of reconstruction will be found to be reduced nearly 30 per cent.

"It seems apparent," Prof. Norton sums up, "that, with care, steel frame buildings can be so constructed as to stand the destruction of their contents without injury to the steel and probably without danger to the protecting material or floor arches; that, with shutters and wired glass, the burning of more combustible neighbors may be expected to cause little permanent injury to the structure proper; and that a district composed wholly of such buildings would be reasonably immune from danger or conflagration."

Capt. Sewell proposes, in order to define *fireproof*, that "to deserve this name, a building should be able

to come through not only one but a number of fires with no damage except the loss of combustible contents, cracked glass, loss of paint and plaster, damage to marble finish, and possible warping of exposed metal work, such as lighting fixtures, elevator enclosures, balustrades, &c." What, in his opinion, this involves in the way of construction is already contained sufficiently here and in the portion of this article previously published.

It will be noticed that while there is hope held out to the building owner of great reduction in damage there is little offered to the tenant. The vigorous combustion within the building, which is the source all [illegible] iety with regard to the structure, is to be fed by the tenant's stuff. His interest ought to centre upon two main points. External imperviousness in general, but especially adequate window protection, and on the inside sub-divis on of areas. This is the most important point to be considered on the inside, both for owner and tenant. It is obvious to anyone entering a building with large undivided areas that there must be great destruction if fire once gets a foothold there ; and, when the building is a large departmental store, great destruction would include great destruction of life.

"The contents of a fire-resistive building, without proper sub-division and no adequate protection against exposing fires, are scarcely any safer as regards destruction by fire," says the National Fire Protection Association's Committee, "than if contained in a building

MUNICIPAL CONSIDERATIONS.

noting some additional lessons drawn from this fire, by Mr. Sachs, which have not been otherwise incorporated [illegible] and builders. They are brief and may be quoted in full :

"The necessity [illegible] menting the ordinary water supply with a special [illegible] stationary pumps.

The necessity of very strictly limiting the storage of highly inflammable and explosive substances in densely populated areas, and severe penalisi g of any default in this direction.

The necessity of making certain building regulations retrospective for existing old buildings, the owners of such old buildings, however, being given a reasonable time for making such improvements.

The necessity of fire brigades having a reserve equipment of portable steam fire engines of great power.

The necessity of officers in charge of brigades having a technical, i.e., either constructional or engineering education of a high standard.

The necessity of fire brigades being supplied with charts of congested districts and suitable miniature plans of all large buildings, these sectional plans to be carried to fires on the appliances serving such districts, as also upon the vehicles used by the respective districts or divisional-officers.

The necessity of developing suburban volunteer and private factory fire brigades to serve as auxiliaries to the professional brigades, when great emergencies occur.

The necessity of the brigades of large centres to have an agreed basis regarding re-inforcement from neighbouring districts in cases of great emergency, which arrangement should include for the provision of standard couplings, or where such couplings are not possible, for standard c nnecting-pieces."

PREVENTION OF HOT AIR EXPLOSIONS.

In reply to an enquiry from the Editor of the Canadian Architect and Builder whether he could suggest any feasible way of providing a safe outlet for explosive gases generated by a smouldering fire Mr. Charles Baillargé writes as follows :

QUEBEC, January 9, 1905.

DEAR SIR,—In answer to yours of the 8th inst. The vertical shaft is no doubt the best solution. No necessity for a separate shaft from each floor or story which in the upper stories would aggregate too great a floor area otherwise utilizable. Say a single shaft of some 10 to 20 ft. area in cross section (3 × 3 to 4 × 4 or 5) reaching from ceiling of basement or sub-basement, up to, through and to several feet above roof to avoid encumbrance by snow, and allow of play of wind or of ambient air on all sides. This shaft must have an opening into it at ceiling level of each floor.

Where the building to be protected is cut up into rooms and passages leading thereto, and as a passage or corridor ceiling need not be as high or lofty as the adjoining apartments, space is afforded along and under such corridor ceilings for horizontal conduits reaching in different directions to stairways, etc., to cause the gases from any point remote from the shaft to reach the same.

But there would be no tendency by smoke or gases to reach or flow towards shaft unless a draught be created therein by artificial or other means. To do this automatically without the use of, as they call it in French an *appel*, the top of the shaft above roof should be fitted with a system of sufficiently overlapping louvres to exclude snow and rain and cold, which, when shut close [illegible] inch or so, or in a way to allow enough air to pass out at all times [illegible] to their full extent to allow of free exit, the louvres being laid at such an angle or so loaded or arranged as to allow of their automatically closing again when the outward rush of air were at [illegible]. However, in addition to the above mentioned precaution of an initial draught [illegible] building to do the needful, there should be from the louvres downwards a rope (a wire one in case of a hempen one being destroyed by fire) which from each, every or any of the floors or stories could be used to force the louvres open as soon as possible after the beginning of the fire.

It is a prevalent mistake to suppose that heated air or fire passing up an elevator or shaft of any kind has a tendency, when an exit is afforded from above, to pass out laterally into the rooms or passages adjoining, or surrounding the well-hole or shaft, and set fire to the several stories on their way upwards.

If you will look at your own or any other cooking stove, you will see that even when the fire or stove door is open and the pot holes open or uncovered, the flame from the burning wood or coal does not exhibit the least tendency to pass out laterally through the fire door or even vertically through the pot holes ; but, on the contrary, seems to and does actually bug the under surface or the flue on its way to the outlet into the stove pipe, at the rear of the stove.

Look also at any old, broken and perforated stove pipe with holes in it as big as you please and you see the fire or flames rushing through it towards the open air without the least tendency to escape laterally through the holes in the pipe or flue.

However, to make assurance doubly sure, while doors in elevators should be shut to confine the heated columns of upward [illegible] and prevent the adjoining outer wood work from catching fire, while drawing smoke, etc., from the several stories towards and into the elevator or other shaft, said door should have open panels filled in with metallic gauze or open wire work of which the meshes like those in the "Davy" or miners safety

lamp, while admitting air from without inwards, is at the same time preventive of the exit of flame to the opposite direction, the heat of the flame being taken up by the wire and leaving the flame too cold to ignite the explosive gases on the outside.

As to the proposed thin glass roof enclosure to top of elevator, which it is supposed would burst open on the ascent of a heated column of air or gases from below ; I do not see that this would act as supposed, because there would be no tendency of the gases to rise in a shaft of any kind unless there were provided at top thereof some initial draught to cause the gases to be got rid of, to pass upwards. Close the roof opening in a chimney flue and immediately all tendency of the flue to draw the smoke towards it would entirely cease.

And again, however unresisting the glass roofing, what assurance would there be of a sufficient stress being brought to bear against it to cause it to yield, and during the delay in doing so, the heated air and explosive air would be passing out laterally from the elevator into the adjoining rooms and passages on the several stories of the building.

Walls surrounding elevators should no doubt be built of say 8 inch brick work or of 6 inch concrete reinforced by steel.

The shaft proposed should also be built of brickwork or concrete, and to avoid projecting too far into corridors, might, in a series of adjoining stores or tenements, be made to answer, each shaft for two adjoining buildings where the party wall between the latter would take up say a foot of their depth or thickness and leave only some 12 to 18 inches to project into a corridor, like an ordinary chimney breast.

The horizontal flues leading to the shaft should be of terra cotta, burnt clay or earthenware pipe as used for drainage and the initial bell end of same opening into stairways, etc. be closed with ornamental wire or open metallic ware and thus rendered inoffensive to the sight.

C. BAILLARGÉ.

At a meeting of this institute, held in St. George's [illegible] Burke, President of the Ontario Association of Architects, read a paper on "Building Construction, [illegible] tion necessary to make a building fire-proof, and of the [illegible]

The contents of the paper will appear in a future number of this journal.

THE TORONTO BEAUX ARTS CLUB.

The architectural students of Toronto have recently started a club which they have called the Beaux Arts. This name, as applied to a club, has, in consequence of the influence which has been exerted by the Ecole des Beaux Arts at Paris upon American architecture, come, on this continent, to be associated especially with high architectural aims.

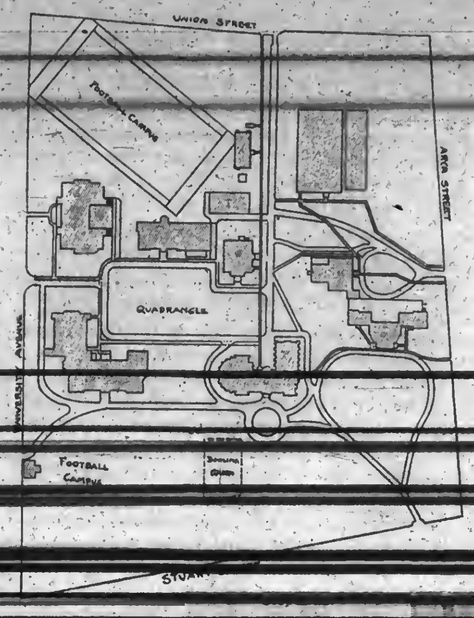
It may safely be said that upon no less ground than this will the club succeed, but, with this to animate them, the smallness of the number of students required by the profession in Toronto is not a bar to success, but may be its real groundwork, if there is a leading spirit of the right sort among them or they come under the right influence from without, and, being few, work well together.

The officers elected at the meeting for organization were : Hon. President, Frank Darling ; Hon. Vice-Presidents, C. H. Acton Bond, W. A. Langton ; President, S. Ashton Pentecost ; First Vice-President, [illegible] lin E. Belfry ; Secretary-Treasurer, L. McGill Allan ; Executive Committee, Clarence Thetford, W. J. Abra, Sidney Paton.

OUR ILLUSTRATIONS.

GRANT HALL, QUEEN'S UNIVERSITY, KINGSTON.—MESSRS. SYMONS AND RAE, ARCHITECTS, TORONTO.

This hall was, as shown by the plan, an addition to the Arts' Building, and, as the name implies, a Memorial to Principal Grant. Its position in the general scheme is shown in the annexed block plan and in the bird's eye view (drawn by a member of the



faculty of Queen's) which is reproduced in one of the [illegible]

It is evident that the memorial to Principal Grant [illegible] Campanile, which is over 200 feet high, is not only the central object of the University group of buildings but forms the main or University avenue entrance.

The group, in one style and of one material, has a harmony, as shown by the bird's eye view, which throws a side-light upon the mess being made, by indifference to harmony, in the far greater opportunity that is offered by the University of Toronto. In plan the memorial building is a galleried hall. The hall seats 700, the gallery 550. The space under the gallery is reserved for an ambulatory and is intended to be the University Hall of Fame, devoted to the reception of memorial tablets, paintings and sculpture. The wide roof is gathered up, at the exposed end into the presentable form of a gable with supporting pavilions, by projecting the body of the hall a little on the end and the ante-rooms on the sides.

In style the later French Romanesque has been followed and all features and details have been studied from some model of that period. The treatment is therefore (as may be seen) scholarly, but, as the newspaper [illegible] iness." In other words it is not a slavish copy, (for the originals were churches), but a practical application of the style to modern uses.

NO. 152 PARK ROAD, ROSEDALE. MESSRS. BURKE & HORWOOD, ARTHITECTS.

This a good typical example of the popular Toronto *multum in parvo* plan. The drawing room is on the front, which is the east; but the dining room is contrived to get a look towards the east too. The dining room in summer can be thrown open to the verandah; one of those provisions by which we are coming to make a luxury of heat. The reception room is evidently capable of similar treatment on a smaller scale. The interlocking froot and back stairs are an ingenious solution of the problem of getting a fine front stair, a roomy back stair, a side entrance and a way to the cellar, all in an extent, taken the largest way, of 17 feet 6 inches on the ground floor. The kitchen and pantry are another case of compression without omission; and the route to the dining room through the pantry could not interfere less with the working space of the pantry nor, while wonderfully short, does it open up any line of sight into the kitchen.

HALL, NO. 123 ST. GEORGE STREET, TORONTO. MESSRS. BURKE & HORWOOD, ARCHITECTS.

The view is taken from the north end of the hall, at the foot of the stair, of which the newel post just appears on the left. The noteworthy point in this hall [illegible] case and the front door and is of no great size, it yet [illegible] functions together—the entrance, the staircase, and [illegible] —the designers have left a space which is associated only with the group of living rooms. The space about with the rooms appears to be 8'6" × 14'0"; but, as [illegible] this it has wide doors or none, and the [illegible]

STATUE OF QUEEN VICTORIA. GEORGE FRAMPTON R. A. SCULPTOR.

This statue, which stands in the Parliament grounds, Winnipeg, is of bronze upon a pedestal of Tyndall limestone in stones of great [illegible] 13 ft. high and 12 ft. square at the base. It is an excellent pedestal too, but fills the eye a little too much in the view, for the statue itself is of almost equal height. It is said to measure 12 ft.

There is no reason why the Queen should be always represented young as if she were an abstraction. A good historical memorial might be made of her as she was, old but with a sane and wholesome personality. Mr. Frampton has preferred to represent not only age but failing health. The contrast between the feeble woman and the extent of power symbolized by the orb and sceptre she holds has, no doubt, poetry in it; but it is a poetry of the sentimental kind, more suited to a sketch than to a monument.

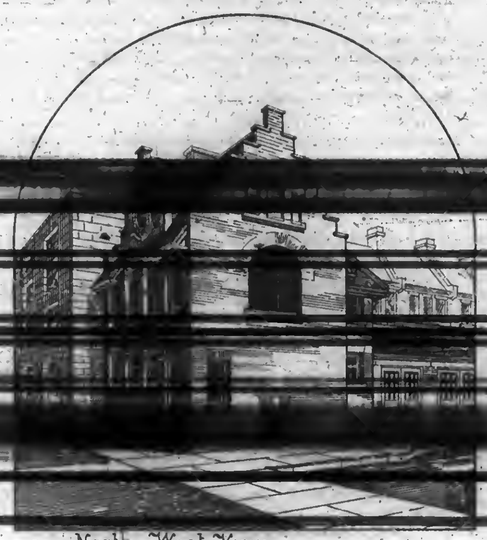
MEMORIAL TO CANADIANS WHO FELL IN THE WAR IN SOUTH AFRICA.—W.S. ALLWARD, SCULPTOR, TORONTO.

[illegible] of this memorial originated in the volunteer regiments of Toronto, and the monument will be erected in Toronto, but it is intended as a memorial to all Canadians who fell in the war. The design was procured by a competition open to the world. There were 34 designs submitted, of which one at least came from France.

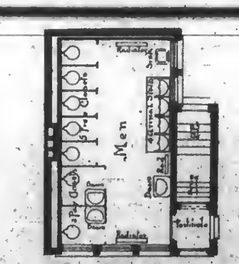
The material of the memorial will be gray granite and standard bronze. The total height is 70 feet including the crowning figure, which is between 9 and 10 feet high. The figures at the base (representing Canada sending her sons to the front,) are on the same scale, as may be seen by comparison with the figure of a spectator on the right, which is inserted in the drawing in order to give the scale of the human figure. The question of a site for this monument is discussed in our editorial columns.

PUBLIC COMFORT STATION, MARKET SQUARE, HAMILTON, ONT. JAMES BALFOUR, ARCHITECT.

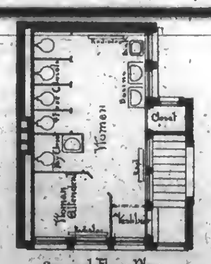
This Hamilton building gives a suggestion that might well be followed in other towns. Buildings of one type, simple but recognizable, placed as far as possible in similar situations, would be a great improvement to a town. They should include arrangements for washing that would not be repellant, accessible upon payment of a small charge. Clean towels in sealed paper wrappers, soap in the form of powder, (discharged from a hopper by pressing a button) are already in use in some places; and there is no reason why the basin should be anything but a catch-basin, under a tap made to run a small stream of combined hot and cold water.



North West View.



First Floor Plan.



Second Floor Plan.

MONTREAL NOTES.

THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

Since the beginning of the current session the P. Q. A. A. has been installed in its new lodgings in 5 Beaver Hall Square. The floors are standing the traffic very well, even at this advanced period of the session showing very little signs of wear and tear. For this result, of course, some thanks are due to those of the profession who sit at home and with luminous intelligence regret that the meetings of the Association are not more numerously attended and more successful.

The new rooms have not been selected primarily with a view to a large increase in the attendance at the functions—the meeting room being in fact somewhat smaller than that in the former premises. So far, however, its capacity has not been strained, the rooms seem suitable and are both quieter and more central than the others.

The first lecture of the session was delivered on the 20th December last when Prof. P. E. Nobbs of McGill University discoursed upon Gothic Carpentry and Joinery. The lecture which was delivered in a pleasantly enthusiastic and informal manner was such as would have proved very valuable to a younger class than were represented in the audience and one would suggest that on such occasions it would be a good thing to send notices to the draughtsmen in the various offices inviting them. As it is these modest youths will tell you either that they are unaware of these meetings or that they are not members of the Society and do not feel that their presence is at all called for—*Experto crede.* It would be well at any rate to put their thirst for instruction to a fair test.

In the matter of private letter writing it is often remarked that [illegible] to keep in view. The more continuous is easier than the more intermittent habit and the frequency of a function lessens its [illegible] and with so many by-paths full of interest as architecture has, there should be scope enough for weekly meetings all through [illegible] him whose enthusiasm leads him rather to solve the inner mysteries of construction and he whose joy is in matters of cost and points of law may give and receive much in conversation [illegible] informal discussion of things. It establishes contact between [illegible] Men express their best thoughts with more freedom when no [illegible] can one realise what are the subjects which are most widely occupying men's minds and on these occasions talent and enthusiasm too modest to assert themselves at more formal times blossom [illegible]

We suggest something of this kind in connection with the P.Q.A.A. in order to increase its usefulness, but knowing well that much has already been done. The society is now organized. That is to say its necessary organs are all there properly developed to be of use but some vitalizing is required in order that the society may go on a stage farther and become as a body a real influence in the province. The spirit of this age demands that every industry profession or science that is to be efficiently carried on must form central rallying points where knowledge widely spread and loosely known and understood amongst the people may be brought together to be compared and made to yield up its secrets and its laws. An architectural association should be the headquarters for architectural reference where an architect in search of information could obtain it or at least the clue to help him to it. For this purpose of course an excellent library would be necessary, kept constantly up to date. But what is of much greater importance is that the library should be easily accessible and actually well patronized. It should be within the duties and power of an architectural association to gather reliable data and statistics on such matters as strength of [illegible] architects—the comparative efficiency of ventilating systems, and the circumstances affecting the acoustical properties of buildings. Collected information on many subjects of this kind would enable the profession to settle scientifically with certainty questions which at present are arranged by rule of thumb with a hit or a miss as a result.

Perhaps the most important function, however, of the Architectural Association of the future is acquiring the confidence and respect of the public. This can only be done by the profession studying in its corporate capacity the desires and needs of the public. There ought to be a large scale plan of each city in the Province upon the table of the Association and members should discuss in front of these their schemes and dreams for the improvement thereof not as an amusement merely, but with the intention to have the thing done.

It was, if we remember rightly, a saying of Gladstone's that a statesman's duty was to take a people's dim aspirations and give them back to them in concrete form. Great writers are often described as expressing what everyone has thought. Artists thought just so but only one has succeeded in clothing the thought in adequate expression. Similarly it is the duty of architects by studying and comparing ideas to perceive what the people want and by the exercise of their imaginative and inventive faculties to give it to them in tangible form. In thoroughly and constantly threshing out questions of municipal improvement there lies a duty which Architectural Associations owe to their townsmen and in doing which they will earn their gratitude and confidence. But this end must naturally be a long way from a society whose members are barely acquainted with one another and are satisfied each to work in his own little hole and corner.

CONCORDIA SALVUS.

Building operations have been very good in Montreal in 1904, and the following figures will give you an idea of what was done.

1904—1335 permits amounting to..... 4,352,287

There have been erected in 1904—1151 dwellings, 41 stores, [illegible] sheds. Repairs to 578 dwellings, 162 stores, 3 theatres, 12 warehouses, 28 factories, 2 churches, 1 hospital, 11 stables and 37 sheds.

Besides the above, 96 fire escapes have been erected, 443 permits [illegible] been granted.

[illegible] was as follows:

Building permits	$1,204.60
Water used for building purposes	3,691.59
Permits for dangerous industries	2,173.00
Permits for motors and engines	2,130.00
[illegible]	$11,299.09

This is about $3,500 more than in the year 1903.

The expenses of the department in 1904, for salaries and contingencies, were $5,550, less than half of the amount of the revenue. Five years ago the expenses were $3,500 and the revenue $350.

PINK A RESTFUL COLOUR.

In the decoration of the stations of the New York subway, it appears that the schemes most restful to the eye are those which are based on pink and salmon tones. The American Architect, reflecting upon this unexpected result, finds that after all it agrees with nature more distinctly than does the theory (proceeding from the abundance of green in the world) that green is the most restful colour to the eye. "To rest the tired eye," the writer in the American Architect points out, "one naturally drops the eye lid. . . . Opaque as the eyelid is, it is still translucent, and as it is permeated with blood-vessels it would seem that the sense of color that the eye derives through the closed lid must be that of pink, very low in the scale. Turn to nature again and we find that the blush-rose and the garden pink are amongst [illegible] are pinks and pinks, and anything verging on the mauves should be eschewed, while a pink that belongs to the salmon family may, on the testimony of the subway decorations, be safely adopted."

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue for lowing their appearance.]

Q.—A subscriber writes: Would you kindly give me a good recipe for the composition of gelatine mould, also a recipe for ingredients for brushing on face of mould to prevent damp penetrating?

Ans.—The so-called plaster gelatine moulds are made of clay, ground very fine, in which is mixed sufficient gelatine to make it work easy. The amount of gelatine will depend somewhat on the quality of the clay and the kind of work it is intended for. Perhaps you meant "moulding wax" which is more often used than the gelatine mixture. This consists of one part pure bees-wax, and from one to two parts of powdered resin dissolved in a metal pot over a slow fire, or on a hot plate. The quantity of resin varies according to the quality of the wax. Poor wax will be improved by adding from one to three ounces of mutton suet, or best white tallow to each pound of wax. Thin white shellac varnish laid on the face of a mould with a fine hair brush prevents damp penetrating. This applies to the so-called gelatine mould. It is unnecessary in a wax mould.

A Manitoba subscriber writes: Kindly give me (1) a [illegible] of a slow combustion grate for a sitting room, letting us know what kind of fuel is best to burn in it? (2) Also state tion and ventilation, to make a frame stable [illegible] horses dry inside during the cold weather. Size of stable 21x16, 8 foot wall and hay loft above?

Ans.—The best grate for the purpose named is a "basket grate" placed in a regular open fire-place [illegible] top. Grate can be drawn forward or back to regulate temperature. The best fuel and most economical is hard or anthracite coal, egg size. (2) For stable make double walls, with one or two inch space between walls. Paper walls inside and out with heavy building paper or felt. Rough [illegible] receive paper. Wrap paper around jamb studs at all openings. Rough-cast outside of building and plaster inside with mortar composed of lime, sand, hair and about 10 per cent. Portland cement. Make cement floor with gutter at rear end of stalls to carry away waste. Have cement floor inclining to gutter from both sides. Lay rough plank floor in stalls over cement for horses to rest on, leave spaces between planks about one inch wide. Planks should be so arranged that they can be removed either separately or all together, so as to clean the cement floor. Building may be ventilated by building a flue at end and placing in registers or a wooden shaft, say 20" x 20", may be built from ceiling to roof in centre of building, terminating in a louvre on roof. The shaft should be fitted with a movable shut-off, similar to a stove-pipe damper, [illegible] to regulate the current of air. End flues, as first mentioned, are preferred. If the work is properly done as suggested, the stable will be warm and dry.

Form "Northwest"—Is it possible to make redwood darker without using a stain, and giving it a fine finish ready for varnishing or polishing?

Ans.—Redwood, or any other wood, will become darker if oiled. Varnishing upon an oiled base simply modifies, but does not prevent darkening. The natural color of woods is better preserved when varnish is used without oil. In general practise it is usual to adopt as a finish upon unpainted work a coat of white glue size, worked warm, without considerable glue body, followed by a coat of varnish. If two coats of varnish can be properly applied it is better to apply the same and omit the size, but to make a good piece of work, the first coat should be well rubbed down with sand paper, or pumice stone before the second coat of varnish is applied. This, however, cannot be well or conveniently done always, so the glue size answers the purpose fairly well. Some finishers use shellac as a first coat, but this tints the wood more than the glue size. If a really "fine finish" is desired, it can be secured more perfectly by "French polishing" the slats before the work is put together. In any case, the best materials are necessary in obtaining a good finish on redwood, but, when properly done, the result will be satisfactory.

From "Vancouver",:—How can I obtain the lengths, cuts and bevels of valley jack rafters, by the aid of the Steel Square?

Ans.—This looks like a difficult problem, but after all, if the roofs are of equal pitch the trick is not a hard one to do. if, however, other pitches are different, it becomes much more difficult and often takes the ingenuity of expert framers. In the illustrations, Fig. 1, the [illegible] of different pitches is shown, that is: A

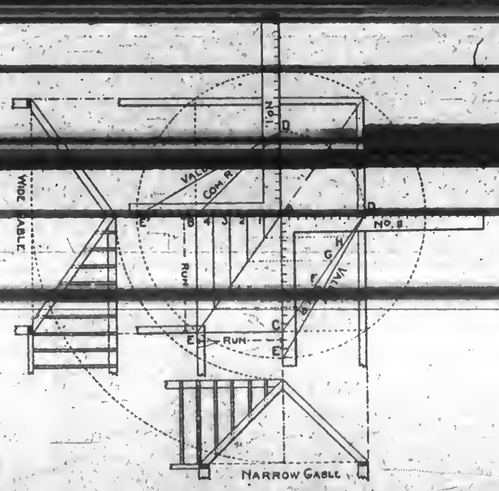


Fig. 1.

20 ft. span joining a 28 ft. span, and both having the same rise. At first sight the illustration may seem complicated but we believe, with a little study, it will be rendered clear. Here, is shown two squares placed with their heels resting at the intersection of the ridges, as at A, and with their tongues along the lines of the ridges. These squares we will call No. 1 and No. 2. From A we lay off the run of the narrow gable on the tongue of No. 1, as at B, and that of the wide gable on the same member of No. 2 as at C.

Now, as the two roofs have the same or equal rise, lay off a like amount on the blade of both squares, as

at D, and by drawing lines B D and C D, we have the length and pitch to scale off the common rafters for both roofs.

Now by squaring out from the tongue at B, and C, intersecting at E, represents the angle of the plate, and the line from A to E represents the run of the valley. Its length A E, taken on the tongue of either square as at E, the line E D will represent the length and pitch of the corresponding valley. This is shown on both squares to illustrate the comparison of pitch to that of the common rafters.

Let us now space off the jacks on the tongue of No. 1 for the wide roof, as at 1, 2, 3, 4, from A to B, and square out to the line A E. The length of these lines 1, 2, 3, 4, represent the run of the jacks and by taking their lengths on the tongue of No. 2, and squaring up to the common rafter, as at F, G, H, their lengths are found as follows: Jack 1 is from D to H, jack 2, D to G, jack 3, D to F, etc. The other portions of the illustration are self-explanatory. Where pitches are equal one set of lines is all that is required.

From "Builder": Kindly advise an "old reader," as to the best method of constructing a cheap fire resisting door which is being placed in a brick wall dividing two buildings, and oblige?

Ans.: The best door to resist fire is the simplest. It should be made of pine and should be made of two or more thicknesses of matched stuff nailed across each other at right angles or at an angle of 45 degrees. If the door way be more than 7 x 4 feet it would be better to use three thicknesses of stuff; in other words, the door should be a thickness proportional to its [illegible] bate, or made flush with the wall when practicable; or if it is a sliding door, then it should be made so that into or behind a jamb, which would press it closely to the wall. The plates being locked at the joints and sec- [illegible] this kind by paneling or otherwise, as the door will resist fire best that has the most solid material in it. In most situations it is much better to fit the door upon metal slides rather than upon hinges. This sort of a door may be fitted with automatic appliances [illegible] is will close of itself when subjected to the heat of a fire, but these appliances need not interfere with the ordinary methods of opening and shutting the door. They only constitute a safeguard against negligence.

From "Country Carpenter": Is there any recognized rules for proportioning the size of rooms in dwelling houses? If so, please publish same, or inform me where I can obtain them?

Ans.: This subject has often been discussed, but has never yet been solved, and we fear it never will, it is of such interest, however, that possibly some scheme may be devised, by which aproximations to good proportions, may be obtained. The experience of a noted architect which we give below, may perhaps be helpful when laying out rooms.

"When reflecting on this subject years ago, we soon arrived at an opinion that the relative proportions of a large room would be quite inappropriate for a small one, as, for example, the double cube, which might do for a saloon 40 ft. x 20 ft.; but, on the other hand, a room 20 ft. x 10 ft. would be very inconvenient. Rooms 40 ft. x 20 ft. we have seen, and they were both handsome and useful. It was, therefore, necessary to devise a kind of sliding scale, giving more squareness to small rooms, and more length to large rooms. As to height, we leave that an open question, some would have more and some less. It would generally range from two-thirds to three-fourths of the width, and must depend on whether the apartment is lighted from the end or side or ceiling. Most frequently it would be from the side.

The scale we devised was as follows:

Length	Breadth	Length	Breadth
50 ft.	30 ft.	20 ft.	16 ft.
40	25	18	14
36	23	15	12 6 in.
30	20	12	11
25	17 6 in.	10	10

The principle is very simple, namely that starting with a room 30 ft. x 20 ft. we add or substract 2 ft. from the length for every 1 ft. of the breadth. Thus, if a room is intended to be 22 ft. long (that is, 8 ft. less than 30 ft.) then the breadth should be 4 ft. less than the 20 ft. leaving 16 ft. Anyone can carry the rule in his memory without much difficulty, simply calling to mind 20 x 20, and making an allowance of 2 ft. of length for every 1 ft. of breadth, whether increasing or diminishing in size. We venture to think that the scale given above is of practical dimensions for dining rooms, drawing rooms, very nearly of billiard rooms, and, as it descends, other apartments. Of course, no one would be so absurd as to advocate every room in the house being strictly to such a scale, but [illegible] and appropriate."

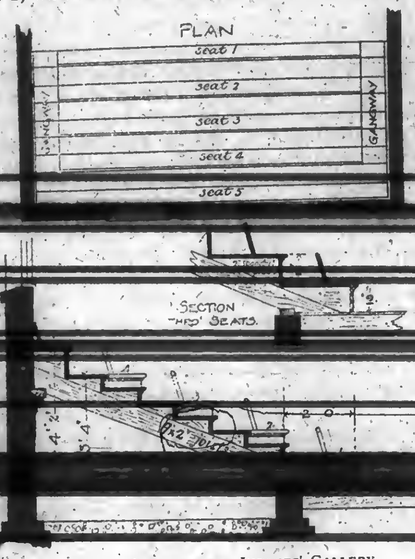
From "City Contractor":—I am in want of a cheap method of constructing a flat concrete roof measuring [illegible] AND BUILDER can give?

Ans.—The area is too large to be covered in one span, and the querist is advised not to aim at a cheaper method of construction that will probably be the dearest in the end. If the roof is to be used as a promenade the beams should be strong enough to carry the weight of the roof and live load of about 1 cwt. per square foot. The area should be divided into bays of 12 ft. in one direction and 10 ft. in the other direction. Rolled steel joists, at least 9 in. deep, should be laid on the heads of the columns across the 12 ft. span and on this should be laid steel joists 7 in. deep by 4 in. wide, at about 3 ft. intervals. The webs should be pierced and tie rods carried from joist to joist, so as to keep the whole immovable. A sufficient quantity of smooth boarding must be used temporarily in order to support the concrete while it is setting; this boarding should be fixed close up to the under side of the joists, and supported by wooden crosspieces and uprights wedged tightly into position. The concrete should then be laid on the top, should be very carefully rammed into the side of each of the joists, and should be brought up to the level of the top of the joists, the proportion should be not more than five of concrete to one of cement. The top may be skimmed over with cement and sand, in the proportion of one to one, and

trowelled to fall to the downpipes. If no person will be allowed to walk on the roof, a cheaper method of construction could be adopted. The roof might be formed of 1½ in. boarding on joists supported on columns, and the boarding covered with such roofing material as is advertised in these columns.

From "Builder."—I wish to construct a raised gallery in a building thirty feet wide, for children to sit on during lantern or other exhibitions which are going on at the other end of the hall, which is sixty two feet long. About five seats will be required and there should be a gangway at each end so that the children may be able to reach the seats from either end. Can you help me out in this matter, either by publishing a sketch, or by a description or both?

ANS.—We submit a plan and sections here with Fig. 2, which we think will be of service; at any rate,



PLAN AND SECTIONS FOR INFANTS' GALLERY.

many good suggestions are offered that will prove helpful. The heights, [illegible] the necessary particulars for working from. It will be seen that there is a gangway on each side of gallery, making each step about 5in. high which should not be exceeded. The joists are 9in. by 2in. placed 16 apart, with 2in. spandrel pieces fixed on same to form the steps. The seats are finished with rounded nosings, with moulding under, returned along ends in the gangways. Each seat must have a back, to prevent children behind kicking those in front. This may be of 9 in. by 1½ in. finished on top with roll, and fixed with stout angle irons let into and screwed to floor. The seats and backs only are intended to be sized and twice varnished. The gallery will seat about seventy five children and the cost would be from $65 to $75, if finished in pine or other soft wood.

Thomas Whittaker, the publisher, met a friend in One Hundred and Twenty-fifth street recently. "Funny dog you've got there," he said. "His tail goes up and down like a pump handle when he wags it."

"Yes," answered the friend, "I live in a Harlem flat, you know, and Carlo has no room to wag his tail from side to side."—New York Times.

TORONTO BUILDERS' EXCHANGE.

The annual meeting of the Toronto Builders' Exchange was held in their offices (Arcade Building), on Monday, January 16th.

A good attendance of members was present, representing all branches of the building interests. The balance sheet for the year showed the finances to be in a most satisfactory condition.

The directors' report also pointed out the material advancement of the Exchange during 1904. The following were elected to form the Board of Directors for 1905:—John Hoidge, president; George Duthie, 1st vice-president; John Maloney, 2nd vice-president; treasurer, James Crang; directors, R. G. Kirby, Thos. Cannon, jr., Henry Martin, Alex. Marshall, George Gander; representative to Exhibition Board, Richard G. Kirby; auditors, George Clay, Frederick Holmes. Mr. David Williams, who has been treasurer of the Exchange and the old Builders' Association for nearly 30 years, was, by unanimous resolution, elected a life-member, and honorary treasurer.

The last annual banquet having proved so satisfactory, it was decided to have another one at an early date, and a committee was appointed to make the necessary arrangements.

RELATIVE COST OF BRICK AND GLASS.

In [illegible] as much brick. In the preliminary study of a building it is often desirable to know how the total cost is affected by putting in or leaving out windows or doors.

In large manufacturing buildings with unplastered walls, where double and triple windows or wide doors [illegible] glass as 6 to 15 in 13" walls; and as 1 to 2 in 17". In the one case we have only the brick to consider; in the other, frames, sash, glass, labor, paint, hardware, stone sills, and steel lintels.

[illegible] and lintels [illegible]

In ordinary buildings with openings about 3 × 7i glass costs [illegible] and not only so, but the mason often forgets to deduct the brick and both prices go in. Here, in addition to the other items, we have jamb linings and inside finish. Allow 11 to 28 in 13", and 1 to 2 in 17".

Sash are estimated 1¾ glass, D. S., paint 20c, which allows 3 coats, brick at $10 wall measure, steel lintels in place, 85 a ton, which is enough in ordinary times.

In frame buildings there is practically no deduction made for studs, sheeting, and siding, so that glass is an extra.

In answer to a painter who says that he painted the sand-finished walls and ceiling of a kitchen four coats of paint as follows: First coat, lead, oil and dryer, very thin; second coat, the same, but heavy; third coat, lead and turpentine, and fourth coat, the same, and is afraid that the job will not wear well, as it is likely to have rough usage and will require frequent washing. The Painters' Magazine says: Kitchen walls and ceilings [illegible] finished in gloss as flat finish smuts too much, and the best thing to do is to wash down the finish with soap and water, to which a little ammonia is added and then give it a good coat of inside varnish or oil paint.

FROM THE

BUILDING OF THE BARN

BY ERNEST CROSBY.

There is a clamor of hammers striking nails into resounding wood, and of trowels clinking against stone, here where they are building the great stone barn.

It is the joyful noise of creation.

They are in haste to close it in, so that it may be launched in time to carry in its hold the ripening harvest of hay, and rye, and wheat, in another fortnight.

Though the carpenters are still at work within, and the masons finishing the east wall, yet the slaters have already half covered the long gable.

The roof-timbers stand out like the ribs of a ship, with keel turned skyward, destined, we hope, to sail down the years-to-come for a century or two, and to bear many an annual cargo of corn on its way from meadow to kitchen and manger.

Who knows but that under more brotherly skies it may become a communal barn, the centre of some better kind of great ranch-family.

The carpenters are flooring the main deck of the great farm-ship.

Half a dozen of them, on their knees, are driving long wire nails into the smooth white boards.

Their left hands are full of nails, and they thrust them into the pockets of their aprons for more.

It takes four or five strokes of the hammer to send the [illegible] and each series of strokes forms a little musical [illegible] with a dull thud at the [illegible] instrument.

The hollow floor, partly open to the [illegible] every note.

Two men are [illegible] dimensions on a pair of wooden horses, and the overseer is balancing himself on the bare beams [illegible]

The hoarse drone [illegible] until the end of each board drops, splintered at the corner, on to the floor.

At the end of the barn we see the masons at work near the top of the narrowing wall, on a scaffold [illegible]

They stand in relief against the sky, like a frieze.

A cart, laden with rough stone, is backed up beneath them, and the teamster, standing on the load, lifts a stone with difficulty, and hands it up to two of the masons.

A workman brings mortar and cement by the hodful up an inclined plane.

There are two other masons engaged in laying stone: One is a good-looking youngster just free from his apprenticeship, and evidently proud of his craft; His cap is jauntily tipped over his curly hair, and he has stuck a geranium in the buttonhole of his waistcoat; He looks as if he were thinking of the village girls, but not enough to interfere with his work, and he taps his trowel against the stone, harder and more frequently than is necessary, as he slashes the mortar into the crevices.

The master mason is setting a large stone at the corner, aligning it with a cord stretched along the wall above it, with blows from the handle of his tool; while he bends over and looks down the precipice outside, and then scrapes off the oozy, bulging line of mortar, and deposits it on top of the stone, the back of his head nearly touching the eaves.

We must go outside to watch the slaters on the roof.

There are three of them up there, with their tools playing their own kind of music on the thin slate.

The little grey-bearded Scotchman moves up and down, sitting and kneeling from gutter to ridge, like a kobold.

Two boys bring the slate up a long ladder from the ground, piling it on their left shoulders, and mounting slowly round by round.

The old man takes it from them, weighs each slate in his hand; giving it a finishing touch at the edges with his slate-hammer, and then, knocking two holes in it with the sharp butt-end for the fastenings, he passes it on to his companions.

The Craftsman.

UNDERGROUND MUNICIPAL STRUCTURES.

Professor A. Prescott Folwell, in a paper read before the American Society of Municipal Improvements, speaks of the loss by leakage from buried gas and water mains and the waste of money involved in perpetually digging after them, taking up for the purpose good pavement which can never be so good again, no matter how carefully it is relaid. Having taken account of the evil he proceeds to speak of the remedy.

"The only solution" he says" which can be adopted as satisfactory will be one in which the paving will never need to be torn up until worn out; in which all pipes, wires, etc., can be laid without interfering with the paving and be readily inspected at any time, this [illegible] The paving [illegible] departments to lay any [illegible] right of way along private property, or else reserve strips of public property—such as alleys or strips between the sidewalk and the street [illegible] would be interfered with by shade trees)—under which all such would be laid. But the other disadvantages are not remedied in this way. It [illegible] branch conduits for the service lines. It seems probable that the model city of the future will have such conduits, throughout its business section at least, where pavements are most expensive and such structures most numerous. In them would be placed the small sewers of the separate system, water, gas and steam heating mains, while in the walls of hollow tile could be run the telegraph, telephone and other wires. St. Paul already has something similar to this in its sandstone sewer tunnels, as has Paris in its sewers. Nottingham and St. Helens, England, comparatively small cities, have had such conduits for several years. In Chicago 60 miles of tunnels for wires have been built, the trunk tunnels 12⅔ x 14 feet, the branches 6.5 x 7 feet. If a private company can do this for its own wires only, it would seem to be more practicable financially when all the above can be provided for. The advantage of such a conduit is not confined to the annual savings if the structures it contains can be originally laid in it, thus saving the excavating and repaving, which would otherwise be necessary. This would amount to not less than 75 cents a foot for each structure, or $3 a foot for four—as sewer, water, gas and steam. (In the centers of the larger cities the number of the various pipes, etc., would be several times this.) An electrical conduit in a business section costs $2 to $4 a foot or more [illegible] even in a city of small size—say 25,000 to $60,000—the saving of $5 to $10 on construction would be effected. The loss of 22.5 to 45 cents per foot capitalized at 4 per cent. would give $5.56 to $11.25 per foot,

or a total of say $10.50 to $21.00 per foot. The conduit offers other advantages besides these financial ones; such as facility of inspection of all pipes, etc., and exact knowledge of the location and condition of each service connection. Also freedom from freezing of water mains, and ease of thawing if frozen.

The weak point in this argument, and probably one of the principal reasons why more cities have not built these conduits, is that before they are really necessary several of the pipes have already been laid in different parts of the street, and instead of saving much of the cost of laying, the use of the conduit requires the relaying of all of them, or of all but one, around which one the conduit may be built. But in spite of this it would seem as though some such a contrivance is a necessity if we are to construct and maintain good paving, and that the time is coming when any city which can afford a brick, asphalt or modern wood-block pavement must afford to first place under it a conduit which will preserve it from premature disfigurement, deterioration and renewal."

PROTECTIVE POWER OF PAINTS.

The apparently capricious variation noticeable in the durability of paint when employed as a protection to structural work, has opened a door to much that approaches quackery on the part of advertising manufacturers, and some empiricism on the part of most engineers.

How widely paints which have approximately the same composition may vary in protecting life, is well illustrated by the behaviour of two ordinary diluted oxide [illegible]

[illegible] Reading Railway.

The first afforded a fair protection for about three years, but during the fourth year it was completely penetrated, and the surface covered had become so badly corroded that the paint could with ease be detached. The second paint—employed side by side with the first—had at least double this life; at the end of the fourth year, still in excellent condition, it showed no single spot of rust and the metal covered was clean and bright.

Now both paints were about identical in composition, insomuch as each consisted of 22 per cent. sesquioxide of iron and 78 per cent. of inert "fillers": although in the first these fillers were represented by 14 clay and 64 hydrated calcium sulphate while in the second only 11 per cent. hydrated calcium sulphate was to be found.

Now, of course, calcium sulphate is slightly soluble in water, and it has been supposed that this explained its unsuitability for use as a "filler" in outdoor paint: but even supposing its solubility to have an appreciable effect, Mr. Robert Job, by his careful investigation detailed in the July issue of the "Franklin Journal," has clearly proved that there exists a far more important factor—one amply sufficient to explain all the noticed difference.

The average diameter of the solid particles in the first paint was about ·008 inch, while in the second it was only ·0004. Thus the average volume of a particle in the first was about 8,000 times greater than in the second! Obviously, therefore, when the coarse particles of the first were scattered at intervals over any surface and connected by films of clear oil, the finer particles of the second were almost in contact and, indeed, several layers deep. In the first case the weathering effect had to penetrate but transversely through a single oil film to obtain free access to the [illegible] through the interstices of the piled particles before even an indirect approach through capillary passages could be obtained.

The importance of fineness in the grinding of paints has long been recognised, but this has formerly been considered mostly in connection with "body" and economy in spreading over a given surface. What Mr. Job has shown, is that fineness in grain is the one grand dominant factor in the life of oil paints.

Plaster of Paris, being a crystalline substance, must always remain granular—can scarcely be reduced to the plastic condition of fine clay; and although it *can* be ground to a fineness suitable for good paint, the cost of the process is almost prohibitive. The best of all cheap fillers would be calcium carbonate, if it were inert. For American Paris white is of extreme fineness and forms a beautiful smooth-flowing paint; but it will not stand acid fumes.

The best method is to leave the choice of a filler to the manufacturer, merely stipulating that it shall be an inert substance and that the paint shall stand the following simple test.

Supposing the paste to contain 26 per cent. oil; 2½ times its weight of pure raw linseed oil is added. After thorough mixing, a few drops of this thin paint are placed upon a clean dry strip of glass, set upright in a temperature of 100° F. for one hour. At the end of the hour there should be no noticeable separation of pigment from oil and but a slight difference in colour between the top and bottom of the streak.—Indian Engineering.

PRESERVATION OF STONE.

[illegible] Society for the Protection of Ancient Buildings, draws attention to the decay of the stonework of many of our ancient buildings, and concludes (we think rightly) that more damage is done by the corrosive gases and vapours evolved from burning coal than by rains, winds, and frosts acting in the absence of coal smoke. To arrest this decay Mr. Turner and his committee advocate the use of lime-wash, the lime-wash to be repeatedly applied to the face of the stone. For reasons which are obvious to all who have any chemical knowledge, lime-wash is very inferior to baryta-wash as a preservation for calcareous stones, and we think the process adopted by Professor A. H. Church for preserving decayed stonework in the Chapter House, Westminster Abbey, is much preferable to that advocated by Mr. Turner. This process consists in first cleansing the surface of the stone with the aid of an air-blast, and then, by means of a pneumatic diffuser, injecting a saturated solution of barium hydrate into the pores of the stone. The injection is repeated several times. By the use of barium hydrate instead of calcium hydrate (lime-wash,) sulphate of barium instead of sulphate of lime is eventually formed in the pores of the stone for a distance of several inches from the surface. Since sulphate of barium is practically insoluble in rain water and in dilute acids, whereas sulphate of lime is distinctly soluble, the advantage of using baryta-wash instead of lime-wash is evident. Calcium sulphate has, moreover, a greater tendency to cause exfoliation of the stone. Those interested in the preservation of calcareous stones will find much valuable information in the reports of Professor Church on [illegible] House, Westminster Abbey, to the Commissioner of H. M.'s Works, dated May 28, 1901, and November 18, 1903, respectively.—The Builder.

ONTARIO CLAYWORKER'S ASSOCIATION.

This Association held its third [illegible] last at Waterloo, Ont. The president of the association, Mr. Byron [illegible] dress to the Association dwelt upon [illegible] development of the Northwest [illegible] for bricks. Discussions were upon [illegible] subject of Machinery and Kiln[illegible]ing it in Proper Order, and upon the question of Burning Bricks and How to Lower its Cost. A banquet was provided by Messrs. Bechtel Bros. Mr. Alexander Johnston is treasurer.

In French military stables 1,750 cubic feet per horse is allowed. In the royal stables of England, 2,500 cubic feet per horse. In the stables of the Marlborough house 1,700 cubic feet. In English military stables the space ranges from 1,452 cubic feet to 2,284 cubic feet. In the Dublin barracks only 560 cubic feet per horse. In the stables of the London General Omnibus Company 820 cubic feet per horse. In large stables the ceiling height should not be less than thirteen feet and better fourteen or fifteen feet.

The third Annual Social evening of the Master Painters and Decorators Association of Toronto was held at the Temple Building on Thursday, January 19. The members of the Association with their friends assembled to the number of about 200 in the large banqueting hall on the 6th floor. Mr. W. J. Bolus, vice-president, officiated in the absence of the President, Mr. Frank McCausland. Several representatives of the Hamilton Master Painters and Decorators' Association were present. A very enjoyable programme of music followed the banquet.

MILTON

We make a specialty of Ornamental Brick and Terra Cotta Mantels

High-Grade Pressed and Ornamental Bricks in red, buff, yellow, salmon, brown, and Special shades.

Pressed Bricks

Our products have a wide reputation and are specified by leading architects

THE MILTON PRESSED BRICK CO., LIMITED

Head Office: MILTON, ONT.

Montreal Agents: T. A. MORRISON & CO., 204 St. James Street

CANADIAN CONTRACTOR'S HAND-BOOK

The third edition of the Canadian Contractor's Hand-Book is now on sale. The book has been revised and enlarged to upwards of two hundred pags, and the title changed to the Canadian Contractor's Hand-Book and Estimator. considerable matter bearing on the cost of performing various kinds of work having been added.

The price of the third edition, mailed free, is $1.00 to subscribers of the CANADIAN ARCHITECT AND BUILDER, and $1.50 to non-subscribers. Order from the publishers.

The C. H. Mortimer Publishing Co. of Toronto, Limited

Confederation Life Bldg., Toronto.
Alliance Building, Montreal.
310 McIntyre Block, Winnipeg.

MANTLES GRATES, TILES

MANTELS: Brick, Tile, Wood
TILES: Artistic, Everlasting, Sanitary
GRATES: Coal, Gas
GAS LOGS
COAL & WOOD BASKETS

FIRE PLACE FURNITURE

Andirons, Fire Brasses, Fire Screens, Fenders, Tongs, Shovels, etc. . . .

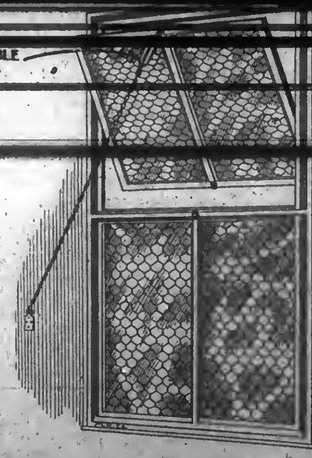
VISIT OUR SHOWROOMS

The VOKES HARDWARE CO., Limited

111 and 113 Yonge Street, TORONTO

FIRE-PROOF WINDOW

NOTICE THE FUSIBLE LINK!



160°, thus allowing the window to close and lock automatically

IT . . . NEVER FAILS

Hollow Sheet Metal Sash and Frame, Glazed Glass

We make them to suit your requirements

Let us send you Illustrated Circular

Made of Galvanized Sheet Steel or Cold-Rolled Sheet Copper

The Metallic Roofing Co., Limited

WHOLESALE MANUFACTURERS

TORONTO, MONTREAL, WINNIPEG

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD)

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited

Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2352.

Branch Offices:

38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

21 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers changing their address should give prompt

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1904.

PRESIDENT	JOHN GEMMELL, Toronto
1ST VICE-PRESIDENT	J. W. SIDDALL, "
2ND VICE-PRESIDENT	A. R. DENISON, "
TREASURER	HENRY SIMPSON, "

COUNCIL.

JOHN GEMMELL	Toronto
J. W. SIDDALL	"

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1904.

PRESIDENT	J. P. OUELLET, Quebec.
1ST VICE-PRESIDENT	J. S. ARCHIBALD, Montreal.
2ND VICE-PRESIDENT	A. CHAUSSE, Montreal.
TREASURER	J. E. VANIER.

P.Q.A.A. COUNCIL.

W. E. DORAN	Montreal.
R. P. LEMAY	Montreal.
J. Z. RESTHER	Montreal.
W. J. CARMICHAEL	Montreal.
A. A. COX	Montreal.
JOS. VENNE	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

R. G. KIRBY, President.	JAS. CRAIG.
JOHN HOIDGE, 1st Vice-President.	T. CANNON, J.
GEORGE DUFFIN, 2nd Vice-President	C. W. BATT.
DAVID WILLIAMS, Treasurer.	WM. PEARS.
W. CLARKE.	A. MARSHALL.
T. W. SELF.	J. R. LYON.
JOHN SCOTT.	JOHN LOGAN.
GEO. GANDER	

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

J. C. SIMPSON, President.	WM. TYTLER.
JOHN NUTKINS, 1st Vice-President.	THOS. JONES.
JOHN WHITTAKER, 2nd Vice-President.	ED. MARTYN.
GEO. S. GOULD, Secretary-Treasurer.	GEO. YOUNG
	S. STEELY

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

W. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M. FRASER.
H. A. BELL, Treasurer.	E. G. BAYNES
T. BRADLEY.	D. SAULT.

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

R. CASS, President. W. W. DALY, Secretary.
E. W. MURRAY, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
R. S. Harrison, Angus Browne, W. A. Irish, D. Cameron, John Douglas, J. W. Morley, Thomas Colter, J. A. Girvin, R. Watson, Victor Bouche, William Alsip, and C. H. Simpson.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.	JOHN DUTHIE
EDWARD M. ROBERTS, Vice-President.	P. LANEE
C. J. SHEPPARD, Secretary-Treasurer.	JOSEPH LAMBERT, JR.
J. H. HUTCHISON.	JAMES H. MAHER.

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)

8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, JR., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUSE Treasurer.	E. Z COTE
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN.	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

We regret to have to record the death, on January 23rd, from typhoid-pneumonia, of Mr. James Milner Crysler, of the firm of Messrs. Sproatt, Rolph & Crysler, Winnipeg.

[illegible] architect, of Detroit, has opened an

[illegible] has decided to withdraw from the building and contracting business which he has carried on extensively in Halifax, and which his father founded. He will finish the contracts he has on hand, and will hereafter devote his attention to the dry dock of which he is manager and to important investments that he has made. He did all the important work for the Imperial Government.

The Don Valley

[illegible]

are now manufacturing

POROUS

TERRA COTTA

FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:

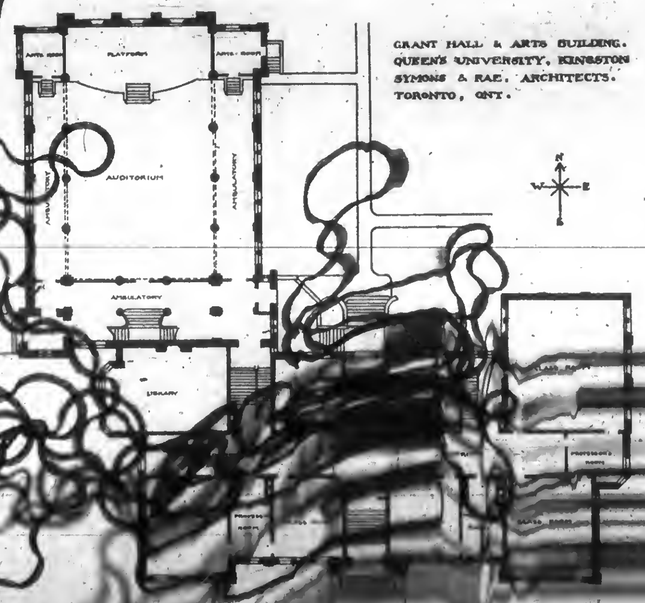
36 Toronto Street, TORONTO

MONTREAL AGENTS:

CAMERON & CO.,
37 Canada Life Building, MONTREAL

Kindly Write for Prices

VIEW OF GRANT HALL FROM THE EAST.

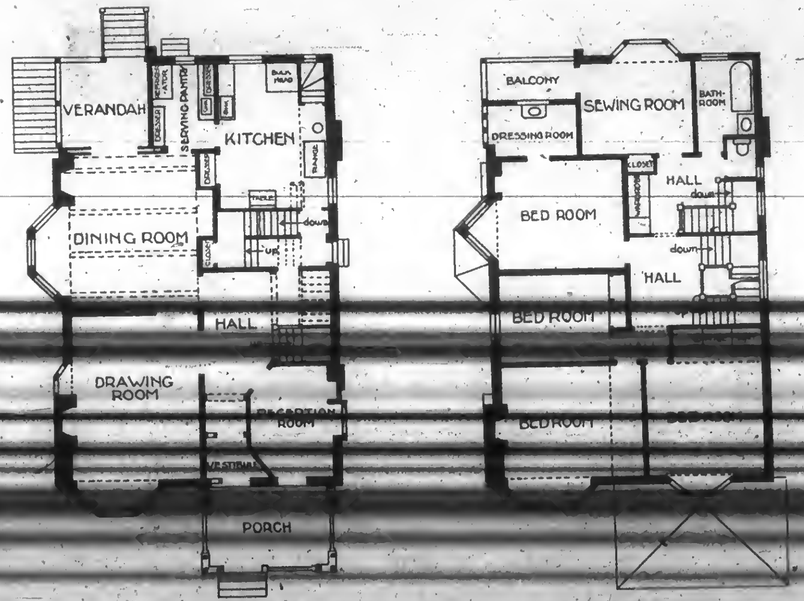


PLAN OF ARTS BUILDING AND GRANT HALL, QUEEN'S UNIVERSITY, KINGSTON.

[illegible] SYMONS & RAE, ARCHITECTS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1905

VIEW FROM SOUTH-EAST.



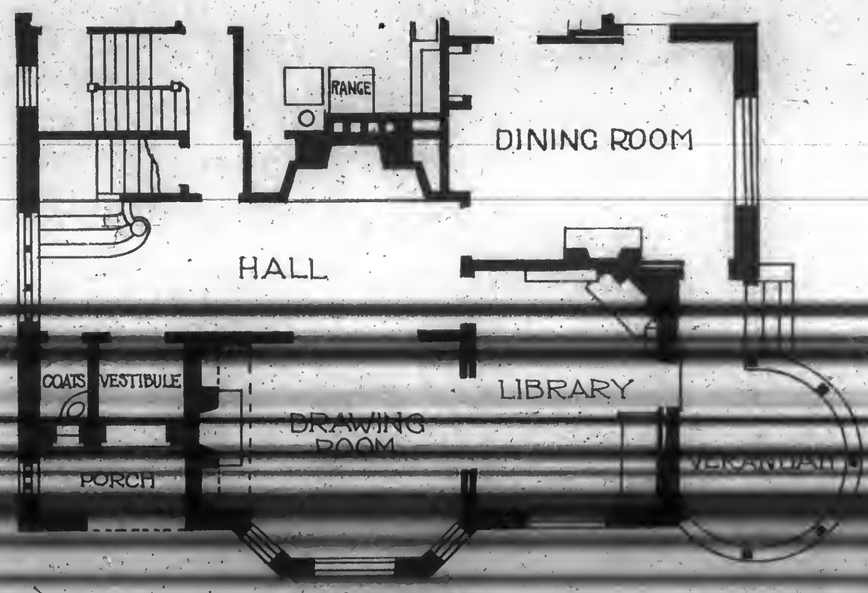
GROUND FLOOR PLAN.

FIRST FLOOR PLAN.

No. 152 Park Road, Rosedale, Toronto.

Messrs. Burke & Horwood, Architects.

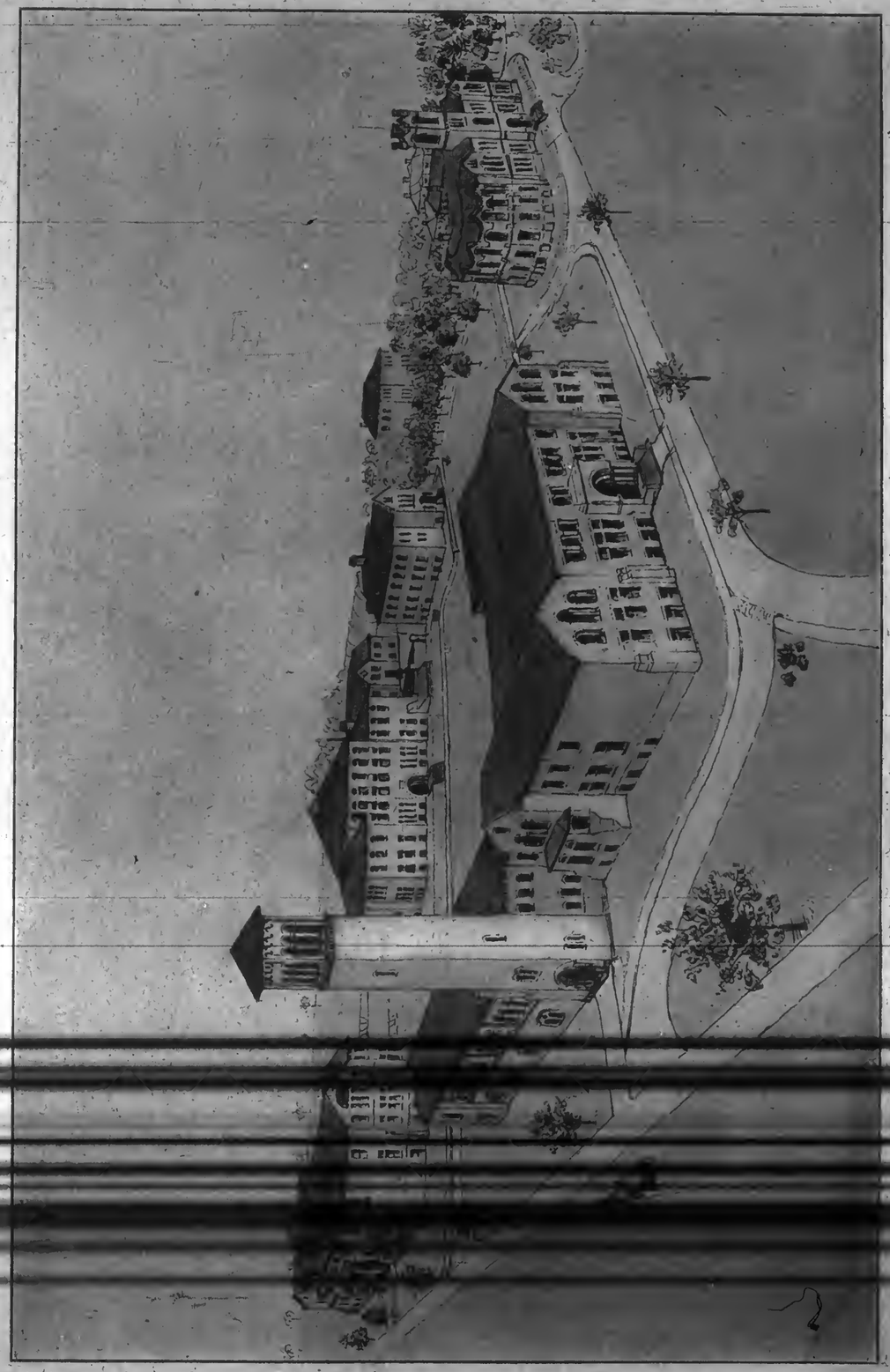
VIEW OF HALL.



PLAN OF HALL.

No. 123 St. George Street, Toronto.

Messrs. Burke & Horwood, Architects.



BIRD'S EYE VIEW OF QUEEN'S UNIVERSITY, KINGSTON.

SUPPLEMENT
CANADIAN
JANUARY

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—NO. 206. FEBRUARY, 1905.

ILLUSTRATIONS ON SHEETS.

C. A. & B. Students' Competition.
Blackwell's Island Bridge, East River, New York—Messrs. Palmer & Hornbostel, Architects, New York.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Section Showing Station in Anchorage of Manhattan Bridge, East River, New York.—Messrs. Palmer & Hornbostel, Architects, New York.
Church at Cohasset—By Messrs. Cram, Goodhue & Ferguson, Boston.
Drawing by Mr. Wilson Eyre in Eighteen Club Exhibition, Toronto.

CONTENTS

Editorial	17	Pickling Steel	ix
Seventh International Congress of Architects	18	The Cost of Buildings	ix
Drawing at the Eighteen Club Exhibition, Toronto	19	Industrial Accidents	x
The Simplification of Plumbing	20-21-22	English Rulings	x
Student's Competition Award	23	One hundred and Twenty-Five Storey Structure	x
Intercommunication	24 25	Wire Wound Wooden Pipe	xi
Province of Quebec Association of Architects	26-27-28-29-30	The Fire Waste	xii
Standard Size of Brick	31	California Excursion	xii
New Pavilion for Toronto	31	German Strike Affects Canada	xiii
New Post Office at Toronto	31	The House Problem in Montreal	xiii
Legal	ix	Household Uses for Electricity	xiv
Steel Radiators	ix		

P.Q.A.A. Code for Competitions.

Old as the discussion on the subject of competitions is, it has still a practical bearing as long as there are competitions, for they are always imperfect. The Province of Quebec Association has made a contribution to it in the "Code for the Conduct of Architectural Competition" agreed to at their recent Convention. They take what seems like a step backwards, in declaring the "limited" competition less commendable than the "open." The ground taken is liberal—that it serves the promoters, purpose less well. But that has also been the ground of the objection usually made to open competitions. It is more possible to get the best men to compete in an invited (and paid) competition. But the P.Q.A.A. have endeavoured to give the open competition a better character by stipulating, first, that the Assessor is the proper person to fix the amount of the prizes—so that there is a better chance of the prizes being fairly remunerative—and, secondly, requiring that the first prize shall not be merged in the commission for carrying out the work, but shall be given in addition to the proper fees for this service. There is precedent for this; and it has reason on its side, for competition drawings do process has to be gone through again, in different style, and usually altered in form. The successful competitor, in fact, though he gets the commission, has to pay heavily out of it for the expenses of the competition. If, as seems inevitable, every step in the process of making competitions attractive has to be made by the profession which hates them, this is a good step to make; and the public, which benefits, had better recognize it as such.

Vacuum Cleaning.

Like all good things, this invention is obtaining continually wider application. In London, which is probably the cleanest city in the world, both indoors and out of doors, the vacuum cleaning machine is to be seen continually, throbbing at the front door of flats and residences; and, for the cleaning of the large interiors of public buildings, the system seems especially designed. Formerly the cleaning of a cathedral meant displacing with long mops as much dust as could be touched, and gathering up as much of it as reached the floor. The vacuum tubes are much more thorough, as they can reach wherever the mop could reach and therefore the services better; and the dust does not appear at all—except in a closed receptacle in the machine outside the building.

New York finds the particular application of the vacuum cleaner, characteristically, in the office building. In the new Times Building all the rooms are [illegible] all cleaning purposes—sweeping floors, taking dust out of corners, from narrow spaces under furniture, from chairs and tables and even clothes—are on hand, and can be fitted to the pipe system as easily as the parts of a fishing-rod are fitted together; and a signal

to the engineer in the basement is all that is necessary to start the suction. The best of it is that the dirt is not merely swept off one thing on to another; it goes down a tube and is seen no more, except by the man who feeds a fire with it. There must be sad mortality among the microbes.

The American Institute Convention.

The recent meeting at Washington had character of importance somewhat new, indicating a change that has come about recently not only in the status of the profession but in its sphere of usefulness. The point of departure was, without doubt, the Chicago Exhibition, which gave the public a new idea of possibilities in the building of cities, and a greater opinion of the importance not only of architecture but of architects. It is since then that the wave of civic improvement has swept over the country, and when the American Institute of Architects met at the national capital, the beautification of which—a pet idea with all Americans—has been put in the hands of a commission, of of which the leading figure is an architect and member of the Institute, the meeting seems to have been regarded as having something of the nature of national importance. The President came to the banquet and spoke in a business-like manner. Other speakers were the Hon. Elihu Root, Justice Harlan of the Supreme Court, the French Ambassador, Cardinal Gibbons, and others who, though eminent, are connected with art and their presence had not the same significance. Other guests were Secretary Hay, Secretary Taft, Bishop Satterlee, seven senators, Hon. Whitelaw Reid, J. Pierpont Morgan, President A. J. Cassatt, Henry Walters, and many others, including Mr. Dooley. And an incident of the evening was the announcement that Mr. Morgan and Mr. Walters had each given $100,000 to secure the purchase of a permanent abode for the Americap Academy at Rome.

This was a big affair and shows the way things are going. The architect will have much to do in the present century but in a larger way than before. The proceedings of the Institute at this convention reflect the state of affairs. There were papers on the methods of financing large building operations; an office organization; on the relations of specialists to architects; and on municipal improvements throughout the country. The national importance of the Institute was marked by the *personnel* of the guests at the dinner, and its international standing by the presentation for honorary and corresponding membership of three English architects of eminence.

The growth of the profession in importance is becoming evident in this country also, but, before it can have the national importance that is given to it in the United States by the American Institute of Architects, there must be some national unity. A Dominion Association is the only parallel to the present state of the American Institute but the need for it must be felt before it can be safely instituted. At present there is no evidence of such a feeling. The Ontario and Quebec associations have each had their conventions recently without any message to one another or any exchange of delegates. And in Toronto the profession is divided into two camps. There is a movement towards union there, and it ought not to fail, for there is a door partly open to the influence of architects for better taste in public works, but it wants united action to open it altogether.

As President Roosevelt said, in his speech at the Institute banquet, 'there are things in a nation's life more important than beauty; but beauty is very important.' He acknowledged that beauty had not been among the successes of the nation in the past, and looked to such gatherings and to such men as he was addressing to determine whether or not this should be true of the future. This, applied to practice, may be stated as separating the function of dealing with beauty in a nation's life from other functions. We may be perfectly prepared to admit the superiority of administration to that of design, but it certainly is different. And good administration includes the selection of a good designer for important works under its charge. The minor works, and superintendence of the construction of all works, are enough for the departmental architects in both state and municipal affairs. This principle is to some extent admitted now, but the decision as to what constitutes sufficient importance for special design is always being made, and hitherto, in this country, with too little regard for the importance of beauty. The architectural associations are really the only guardians of public taste at present; and the greater their union the wider will be their influence in this respect.

SEVENTH INTERNATIONAL CONGRESS OF ARCHITECTS.

At the closing meeting of the Sixth International Congress of Architects in Madrid (Spain) last year the Royal Institute of British Architects was directed to organize the Seventh International Congress in London in 1906, and certain members of the Institute were named and added to the "Comité Permanent des Congrès Internationaux des Architectes" (Permanent Committee of International Congresses of Architects); the Canadian members of this committee are Messrs. W. E. Doran and Alcide Chaussé, architects of Montreal.

The organization committee have announced that His Majesty King Edward the Seventh has consented to be the Patron of the Congress, and that His Royal Highness the Prince of Wales has consented to accept the position of Honorary President of the Congress.

The Congress will be held in London on July 16th, 17th, 18th, 19th, 20th, and 21st, 1906.

discussions on architectural subjects of international importance, an exhibition of architectural art, excursions to various points of interest around London, visits to historical buildings and monuments of London, one or two social functions, and a grand banquet.

about the comfort and amusements of the ladies accompanying the delegates. They will be admitted to the inaugural meeting, to the excursions and visits.

All communication relating to the Congress must be addressed to Mr. W. J. Locke, Secretary of the Organization Committee, 9, Conduit Street, London, W., England.

DRAWING AT THE EIGHTEEN CLUB EXHIBITION, TORONTO.

The distinguishing characteristic of this club's annual exhibition has always been the number of American drawings which the club, as a section of the Architectural League of America, has had the opportunity of presenting. On the present occasion, the circuit exhibition of the league not being due, the local drawings and photographs of work by members of the Club and other Canadian exhibitors were supplemented by some loans from American designers, of which the principal contributions and the conspicuous feature of the exhibition were Mr. Hornbostel's enormous drawings of the New York bridges over the East river. Of these we have been able to reproduce a small part of one drawing about five-eighths of the original size. The original drawing is 7 feet 2 inches in length and the portion here presented, is 1 foot 4 inches in height. It is not the largest of the drawings nor is it the most impressive; it is simply the most compassable for reproduction. Nor can the half-tone process be said to properly represent the delicacy of the original; it simply gives a fair representation of the character of the handling. The drawing is done with a soft and black lead pencil, and, apparently, upon tracing paper—that pure white tracing paper that gives such an attractive line. The work was evidently done with great freedom. Not that there is any mere generalization for the sake of the black and white effect; the most sketchy passages are still precise, representing something definite. But there is no sign of hesitation, no muddling; and, indeed, in looking round the large room that is filled by Mr. Hornbostel's drawings, it is evident that he must have worked rapidly or he might be drawing yet. The drawings are a feat for which one must seek a parallel among the facile draughtsmen of the Renaissance.

The justification for these drawings is, no doubt, a reasonable anxiety on the part of the municipal authorities as to the appearance of such enormous structures; impending over the city like creations of a dream, and dwarfing everything in sight. The portion represented in our illustration sheets is less than a quarter of the actual bridge, and there is an additional mile or more of approach at each end, which is still of great bulk and propped up above the tops of the buildings. There was good reason to doubt whether the city would not appear to be crushed under the weight. That is a point upon which the very slight geometrical drawing, which also appears in this exhibition and which would be enough for the purposes of the designer or constructor, throws no light. A view of the

assurance of the result, and fortunately Mr. Hornbostel had the graphic skill to represent the scene. The scale of the structure may be gathered also from the section of the anchorage pier of another bridge in the illustration sheets. The size of the hall contained within the pier, as measured by the figures, is striking.

struction began to develop has often raised the question where the stopping point will be: these drawings suggest a doubt whether there is any stopping point. It is to its tall buildings that New York owes what picturesque interest it has. The bridges, when completed, will add to that interest in the same line. The improvements to the City Hall Square, also drawn by Mr. Hornbostel—an extensive clearing surrounded by lofty buildings, where the City Hall, in the middle, looks like a cottage, and human figures have almost reached the vanishing point—appear now like the natural course of affairs. And if Prof. Despradelle's great design (see p. x.) for a municipal building, to cover sixteen of the New York blocks and rise 125 storeys in height, is ever executed, no doubt we shall regard it as the latest but not the last.

This building would make a remarkable drawing, and a picturesque treatment would show it best, for it would be beyond the limits of detailed representation as it would be of detailed perception.

But such drawing is not, properly speaking, architectural drawing, and it is a question how far it is a good kind of drawing for architects to do, except in a fragmentary way, to check their work and also to stimulate it. Drawings of effect, that is to say, are useful, to an architect, for enquiry and for suggestion, while the work is in progress. When it comes to assertion—such is the effect—the architect's work is done; and it wastes his time to do this kind of work, if he can get anyone else to do it. Architectural drawing is in fact a study not of beauty but of the facts that go to make it. It is scientific rather than artistic, and the drier the light in which the facts are represented the less chance there is of illusion.

Mr. Wilson Eyre's drawings are a treat, but imitators had better beware. The set of three drawings in one frame, from which our illustration of Mr. Eyre's work has been extracted, cannot be said to be unuseful, and there is a practicalness about the plan in the foreground which makes a great part of the interest of the drawing, particularly, by the way, in an exhibition singularly lacking in plans and much impaired in usefulness thereby; but the drawings have a decorative value that is pictorial and suggests the suspicion that they have the pictorial virtue of idealization; a quality which, if it carries the truth with it, does not carry the whole dull truth. With the flowery theme of gardens (with which all Mr. Eyre's drawings of this kind are concerned) his graphic methods are judicious, if not inevitable, and are certainly a delight to the beholder, but, where the beholder is a client and the subject is a house, he may reasonably ask if the house will look like that.

Our illustration of Messrs. Cram, Goodhue & Ferguson's church at Cohasset is reproduced chiefly on account of its interest as the realization of a well known drawing, which is probably in the collection of most of our readers. Part of the virtue of the design [illegible] missing belfry, which crowned the composition, got its value from the plainness of the rest which without it seems plain indeed. But it would not suit its work so [illegible] there a desirable characteristic for Gothic architecture in America.

There were 1,147 new dwellings erected in Montreal during the year, in spite of high wages and [illegible] high prices of building material. That general rise in rents last spring was more encouraging to the landlords than other conditions were the reverse.

THE SIMPLIFICATION OF PLUMBING.

A paper read on Nov. 10th last by Mr. J. Pickering Putnam, F. A. I. A., before the Society of Arts, Boston, deals with this theme under the title "Sanitary Plumbing and the Plumbing Laws." The paper is printed in full, with illustrations, in the American Architect, for December 24 and 31. Much of it is occupied with demonstration before the audience of the facts of syphonage, by means of an apparatus of pipes traps, etc., with an air pump attached to produce the necessary vacuum. This is not new matter to the profession and may be omitted. Briefly stated siphonage occurs, when water is discharged from a fixture in an upper storey, because the friction of the walls of the soil pipe prevents the air from following as fast as the plug or piston of water falls, and therefore there is a volume of rarefied air immediately behind the piston, and this, when it passes the inlet from a fixture on a lower storey, upsets the equilibrium of air pressure on each side of the trap and the weight of air above the trap, being greater, forces the water down and out of the trap. As scientifically stated in the paper "the inertia of the water in the trap affords less resistance to the air than the friction along the sides of the soil-pipe." The purpose of back venting traps is to furnish a supply of movable air which, being immediately connected with the waste pipe where it leaves the trap, can, when the air in this pipe moves out to fill the vacuum in the soil pipe, drop into its place more readily than the air in the room on the other side of the trap.

When the plug of water gets near the bottom of a tall pipe, back-pressure, the reverse of siphonage, is very likely to occur because of the bend between the vertical soil pipe and a horizontal drain pipe of the same dimensions. As the bend retards the passage of the air in front of the falling plug of water, the air between the water and the bend becomes compressed, and fixtures which are near the bend are apt to have their trap seal broken by back-pressure resulting from this. For this the back vent, at the angle at which it is often connected, does not seem as if it would be the easiest way of relief.

It is this back venting air pipe and the plumbing laws which require it that is the principal occasion of Mr. Putnam's paper. He has been studying the question for the last twenty years; in 1891 got the Boston Society of Architects to take the matter up and make an effort to have the back vent law repealed; and now that this Society has appointed a Committee on the revision of building laws, which invites suggestions, is making another effort of which this demonstration before the Society of Arts is a part.

But there are other amendments to the plumbing law proposed in his paper. He states them as follows:

"1. More than half of the increased complication is due to the so-called ("back venting") of the traps of all fixtures. We have, for instance, bath-tubs, wash-basins and other fixtures, whose traps consist in bends [illegible] passage of dram-pipe air into the house. Our building law requires every such trap to be vented by a special air-pipe extending from the sewer side of the trap up to a point above the highest fixture on the stack. The original purpose of the law was to protect the trap seals from what is called "siphonage." But soon after it was enacted it was discovered that the air-current induced by the back-vent pipe was itself far more mischievous than the danger it was expected to remove, in that it operated to destroy the seal by evaporation; and so rapidly did it do this in some cases, that in at least one large city the Board of Health felt obliged to issue notices to house owners advising them to have the traps refilled by hand in houses temporarily unoccupied, as often as once a fortnight, in order to restore the seal destroyed by back venting.

It was also very soon found that the system was unreliable on account of deposits of greasy sediment within the vent-pipe and of snow or frost at its top, which rendered it inoperative. Other difficulties and dangers revealed themselves as time went on, as I shall show directly.

On the other hand methods of securing positive protection without back venting were multiplied, until to-day the thinking man is puzzled to understand how the public can continue to allow to exist *such a foolish and costly method of ensuring insecurity.*

2. The next important modification of the law recommended consists in the omission of the main house trap in the basement, and of the external sewer vent often resulting from its use.

3. A third modification consists in requiring every fixture to be constructed with an outlet large enough to fill its waste-pipe "full bore," in order to keep these pipes clean by thorough flushing.

4. A fourth consists in reducing the number of fixture traps required. The law now calls for a separate trap under each fixture, no matter how near to one another they come. An exception is made in the case of several adjoining wash-trays, which are allowed to have a single trap between them. This good feature should be extended to all adjoining fixtures. I hope to be able to show you that it is much more scientific as well as much safer and more economical to use one trap in such cases than several.

5. Moreover, it is for important reasons better to place the trap at or below the floor-level than close to the fixture it serves, as is now required by law.

6. A sixth modification consists in omitting, in most cases, the trap now called for on all rain-water leaders, because a trap here reduces the ventilation and increases the complication and expense. But more than this, this trap prevents the use of the main soil-pipe as a rain-water conductor. There is no possible way of flushing the soil-pipe better than by admitting rain-water, where the combined system of sewerage is used.

7. A seventh modification consists in striking out the restriction in the law, limiting the jointing of cast-iron pipes to lead calking. Probably no more unscientific method of construction now exists in the whole domain of house building than this, iron and lead having no more constructive affinity for each other in jointing than cats and dogs. Other really scientific methods of jointing cast-iron have recently come into the market which are both reliable and much cheaper.

8. Finally, the provision requiring water-closets to be supplied from cisterns with flush-pipes not less than an inch in diameter should be modified. Better and simpler means for flushing are now known. . . ."

The evaporation of trap seals, which is the principal source of danger from the back-venting air-pipe, is thus accounted for:—

"The air of a house being warmer in winter than the [illegible] pipe is conducted over or near the crown of the trap and escapes at the roof. In summer the reverse current evaporates out the trap-seal with a rapidity proportioned to its proximity to the trap, its dryness, temperature, rapidity of movement, and, in short, in proportion to its efficiency in performing its function of ventilating the branch waste-pipe and guarding the seal from siphonage, and in experiments which have been from time to time published it has been found that seals have been destroyed by this cause in actual plumbing work in less than ten days. If the vent is not connected with an S-trap at or near its crown it will not protect it from self-siphonage. Hence the requirement in the Boston laws, which leads to a quick destruction of the seal by evaporation."

There is also danger from the stoppage of the air-pipe for various reasons which do not disclose themselves, so that, the only effect of the presence of the air pipe is to give a false sense of security while the traps are being continually siphoned. The following are some of the causes of stoppage:—

"Clogging with grease is very common.

At every quick bend under a vertical rim of iron vent-pipe rust is certain to collect. A comparatively small amount of flaking off of rust or sediment in such a place may suffice to destroy the efficiency of the pipe.

Sagging [in a horizontal lead branch of the air-pipe] is another frequent cause of failure. Water and sediment collect in the sagged portion, and failure is again the result. Finally, hoar frost and snow often close the upper opening of the pipe above the roof, producing again failure.

Moreover, the chances of leakage by bad jointing are evidently increased in proportion to the increase of piping, and what is more important still, no water-flush passes through the vent-pipes, and there is, consequently, nothing to announce to the eye the presence of leaks, which may therefore do mischief before the leaks are discovered." . . .

The process of development has been through the pot-trap now discarded in favour of more scientific forms. The trouble with the pot-trap is that it is not scoured by the flow of water and becomes in time by the deposit of grease (Figs. 1 and 2) converted into a S-trap.

FIG. 1.

FIG. 2.

While they remain clean the pot-traps are not siphonable, and their power of resistance is directly proportional to their diameter and has nothing to do with their depth of seal. It is the supplemental water that is the source of safety not only from siphonage and back pressure but from such evaporation as is still possible in a system that does not require air pipes. The ideal trap must have a reservoir for water and yet must be no larger than the pipe in section, so that it may be scoured at each discharge of water. The first form of trap answering to these requirements is shown in Fig. 3. It is thus described by Mr. Putnam:

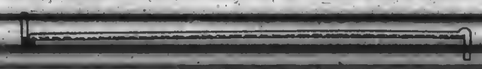


FIG. 3.

"[illegible] long horizontal body made of a plain round 1½-inch pipe. Opposite the trap proper is the sewer-connection piece, also made of a bent 1½-inch pipe. I call the long body the "reservoir chamber." The water lies along the lower half of this chamber, leaving room, under siphonage, for air to pass above it without disturbing the water below it, provided the siphoning action is not too severe. The action is shown in Fig. 4. Less and less water is driven out of the trap at each siphoning action, because the air-space above the water is each time correspondingly enlarged, and the resistance to siphonage is accordingly increased until a point is reached where no further reduction of its level by siphonage is possible; the water spray caused by the suction adheres to the long body while air escapes.

Nevertheless, this form is too long and unwieldy to be practicable. Moreover, under strong siphonage waves are formed which, when they reach the top of the pipe, act like pistons in driving out the rest of the water. The wave may be broken up and the length reduced by bending the pipe back and forth on itself as shown in Fig. 5. This trap has been tested and found able to withstand indefinitely the most powerful siphonage which can be applied, namely, a strain which in a single discharge destroyed the seal of a fully vented S-trap with a new vent-pipe only 10 feet long. The same strain broke the seal of an unvented 4-inch pot-trap and siphoned out an S-trap having a seal 6 feet deep." . . .

FIG. 4.

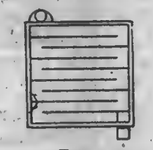


FIG. 5. (HORIZONTAL SECTION)

This is the typical form of anti-siphon trap. Resistance to siphonage can be still further increased by adopting the form shown in Fig. 6. In this form Mr. Putnam says, "friction is reduced and centrifugal force

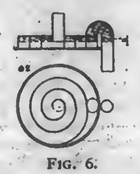


FIG. 6.

aids in the separation of the air from the water, leaving the latter in the trap while the former escapes." And as power of resistance is increased, the trap may be reduced in bulk. The paper continues:—

"Should this trap be used under a fixture having a small outlet and therefore furnishing little or no scour, it will act like a straight pipe, and will, like it, in time suffer a diminution of its area, by accumulation of greasy or gelatinous deposit along its wall. But, as in a straight pipe, the accumulations will be substantially uniform throughout, because the scour and form is uniform throughout, and its resistance to siphonage will remain the same, because its principle of resistance [illegible] the trap in respect to its proportion to the sectional area of its waterway will increase and thus correspondingly increase its resistance to siphonage. Should however be completely closed, its closure will announce itself by the simple cessation of the waste-water to flow out and then the obstruction can be removed through the clean-out cap." . . .

Having thus established a trap which, as he says, is "vented through its own inlet pipe," Mr. Putnam [illegible] which results from this.

"The champions of back-venting have, as a matter of fact, abandoned to-day their original claim that it served to protect trap seals from siphonage. They occasionally adhere to it, however, on the argument that it is needed to purify the branch waste-pipes by aeration.

But it is now recognised that ample water-flushing

through properly constructed fixture outlets, followed by an equally thorough pure-air flushing from the room through the fixture and trap, is infinitely more effective than ventilation with foul air alone from the soil-pipe through the back-vent pipe, and is, indeed, altogether sufficient.

Hence the law should require every fixture to be constructed on the principle of the "flush-tank" by having outlet and outlet-valves large enough to fill their waste-pipes and traps "full bore" at every discharge. . . .

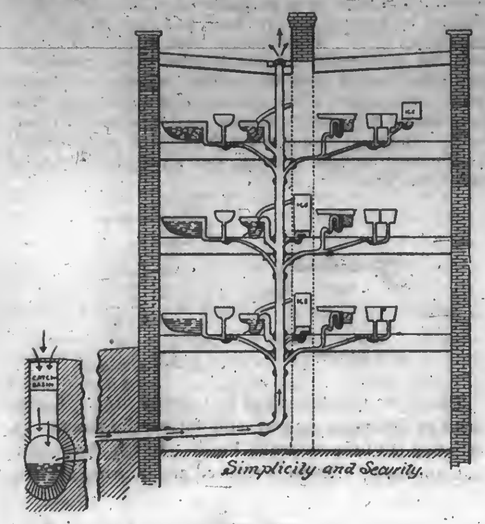


FIG. 7.

Figs. 7 and 8 show the same fixtures in a house plumbed in two different ways—Fig. 7 being in accordance with my recommendations and 8 being in accordance with the manner now sometimes seen in the finest houses. On the extreme left of the latter is the outside sewer vent, and on the inside, next to this, is the house-trap and circulation-vent. We have also

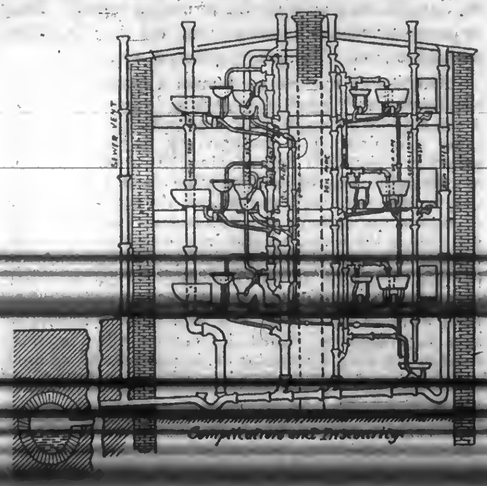


FIG. 8.

back-vents, drip-vents and rain-water pipe, and all of these unnecessary stacks are very common in the modern house.

Fig. 9 shows a part of this work enlarged. It is taken from a well known house in New York.

My reasons for urging legislation prohibiting the use of the main house trap, or "intercepting" trap are, first, because its use prevents the best and only efficient and practical method of adequately ventilating the sewers, and, second, because it adds an altogether useless expense and complication to the plumbing.

Recent investigations by eminent scientists have shown us the fallacy of the popular idea that the air of sewers abounds in disease germs, and so sight-seers may now visit the famous sewers of some of the great cities of the world with the same feeling of safety they enjoy while seeing other regular "sights."

Germs are "particulate," as Dr. Carmichael, of Scotland, expressed it, and have no more power to raise themselves from the water or moist surfaces of sewers than have any other particles of vegetable matter, like leaves or small sticks. If, by any chance, parts of the sewage above the normal level of the flow become dried, as in periods of drought, and are then lifted and wafted along by some unusually strong air-current, it is found that they very soon fall again into the water by gravity or are carried against a wet surface in a bend or branch of a sewer by the same air-current that lifted them. Furthermore, it has lately been discovered, and the discovery satisfactorily corroborated, especially by the noteworthy and most interesting researches of the Englishmen, Laws and An-

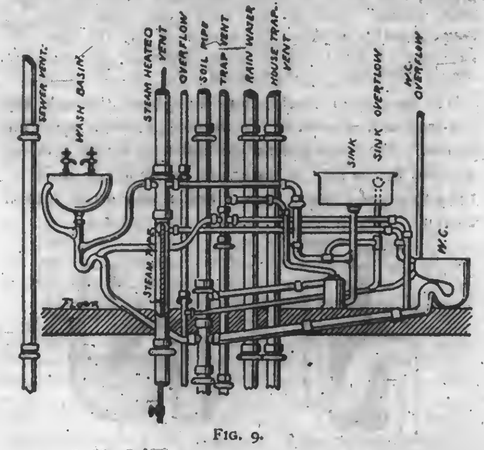


FIG. 9.

drewes, that the specific germs of disease do not thrive even in the water itself of sewers. They appear to be destroyed by other species of germs, harmless to man, which abound there.

In short, it has been determined that the dreaded germs of specific diseases are, of all places, least to be sought for in the air of sewers. They may abound in the air of the streets above the sewers, but not in that of the sewers themselves. Hence, if they are borne into our dwellings by air-currents at all, they must enter by way of doors and windows and not by way of the drains.

Note that we are speaking of germs and not of odors and gases. These latter do abound in the air of badly ventilated sewers and are unwholesome to breathe continuously. But they are immediately dangerous only when in an exceedingly concentrated form, [illegible] tions and by proper plumbing regulations. One of the most effective and rational of these precautions is thorough sewer and drain-pipe ventilation.

Simple openings into the sewers at intervals along [illegible] power to effect proper ventilation. The foul sewer may thus remain foul, and an opening here and there at the street level only concentrates the nuisance in the worst manner at special places for the annoyance of the public.

It is much better to carry the foul gases to the tops of the houses than to emit them at the street level under the very noses of the passers-by. Soil-pipes can now be constructed and jointed so as to be absolutely tight, and the objection that it is dangerous to carry the sewer-air through the houses is no longer tenable.

A public sewer becomes very well ventilated and practically safe when its ventilation is effected by making every house drain and soil-pipe a ventilating flue. The sewer has then, in cities, special 4-inch suction tubes every 10 or 15 feet throughout its entire length, the houses averaging, say, 20 or 25 feet in width. We know that whatever putrescible matter, excepting street washings, is to be found in the sewers, comes from the house drains themselves.

Assuming, then, that the houses average 25 feet wide and 50 feet high, the number of running feet of soil and drain pipe in each would average at best not less than 100 feet, and the interior surface would, therefore, contain probably at least twice as much decomposing matter as the 12 ft. of sewer serving each house. It would be absurd, therefore, to insert a disconnecting trap and a vast increase of extra piping for the mere purpose of excluding this small extra drain-pipe air, even if it were not demonstrated that this very complication increased rather than diminished the chances of its entrance.

Even the foulest sewers and cesspools must cease to be foul the moment they are ventilated through every soil-pipe. Probably the most dangerous substance in our sewers to-day is illuminating-gas escaping from leaky mains, which modern science has, I believe it can be maintained, at last rendered unnecessary. The house trap is responsible for the presence of this gas in cellars and subways. It is exceedingly important that it should, where it is formed, be diluted and carried up above the houses and thus rendered comparatively harmless.

In conclusion, I will say in regard to calking cast-iron pipes with lead, that the law should rather prohibit this than specify it to-day, in view of the very recent methods discovered of jointing cast-iron both scientifically and economically, the joint permitting of a certain amount of rotation and play of the pipe without sacrifice to its soundness even under pressure."

STUDENTS' COMPETITION AWARD.

The judges in this competition, Messrs. W. L. Symons, appointed by the Ontario Association of Architects, A. H. Chapman, appointed by the Eighteen Club, and J. W. Lyle, chosen by the other two judges, have awarded the first prize to the drawings by "Ghost"—Mr. W. B. Van Egmond, of the office of Mr. G. A. Harvey, Toronto; the second prize to "Colonial"—Mr. S. Douglas Ritchie, of the office of Messrs. Finley & Spence, Montreal; and the third prize to "P"—Mr. Gordon M. West, of the office of Mr. Geo. W. Gouinlock, Toronto.

The authors of the several designs describe their materials and the judges criticize the design, as follows:—

"GHOST."

DESCRIPTION—Brick to be common hard red, laid with ½" white mortar joint. Half timber work to be of white pine stained a dull chocolate, and plaster to be white roughcast. Cornice, windows and pergola to be painted a cream white. Roof to be covered with shingles stained olive green; ridge to be galvanized iron. Brackets under cornice to be ½" x 1½" iron painted black. Outside doors to be [illegible] ceiling. Drainage to run into cesspool and overflow to be distributed in garden. Interior finish: Dining room—Georgia pine stained dark green, Burlap panels, and coved stucco ceiling. Halls and staircase—Georgia pine, stained. Dado. Drawing room—white pine, enamel finish. Bedrooms—white pine, painted white. Kitchen—white pine, painted grey.

CRITICISM—These drawings by "Ghost" are presented in a neat and workmanlike manner, and show taste and thought.

The plan is well arranged; the handling of the stairs and the placing of the dining and drawing rooms being particularly happy.

The service from the kitchen to the front door is well taken care of, the servant being able to get from one to the other with despatch.

The elevations are well treated, and show a pleasing combination of brick and stucco. A bad feature is the treatment of the angleover the main entrance.

"COLONIAL."

DESCRIPTION—Brickwork to be Flemish Bond, dark blue headers, with large white joints. Shingled roof stained a silver grey. Exterior and interior wood work to be painted white.

CRITICISM—In the design submitted by "Colonial," the general idea of placing a rectangular building in a rectangular lot so as to divide it in two nearly equal parts is not very interesting. The ground floor plan might be criticised in giving exactly the same importance and expression to the kitchen as to the three principal rooms, and also in having no exit to the garden except through the serving pantry, which has a very low ceiling.

The colonial style is carried out simply and in good taste, the side elevation being inferior to the other two elevations in proportion. The drawings are neatly and well presented.

(They do not appear so well presented in our illustration sheet as, in response to the request to have the drawings arranged on a sheet 8" x 12" or in that proportion, "Colonial" put each plan and elevation on an 8" x 12" sheet, and the reproducer has been obliged to lift them off by photography and arrange them as best he could.)

"P"

DESCRIPTION—Not returned.

CRITICISM—In the design submitted by "P" the question of the proper aspect of the various rooms has been entirely overlooked. The dining room should have been placed so as to get some east light. It is not satisfactory to bring the main entrance of a house of this size under the stair landing. In this case in all probability not more than 7 ft. 6 in. of head room can be obtained. A dark coat room is unsanitary, as well as being unsatisfactory to use.

On the whole the plan shows thoughtfulness. The exterior is to be commended on account of its simplicity, the rendering, however, could have been much improved upon.

PROVIDING FOR ADDITIONS.

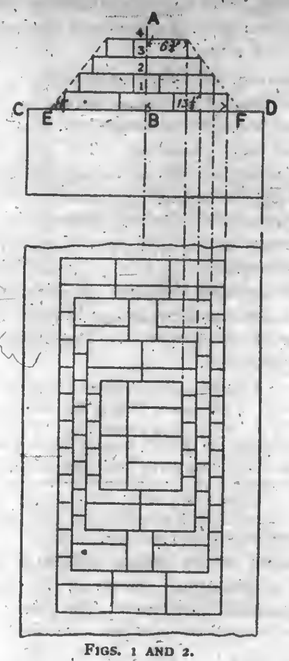
To the other burdens of an architect the Architects and Builders Journal would now add the responsibility, or at any rate a share of the responsibility, for providing for future enlargement. Instance is given of a library building which had to be pulled down and re-erected before it could be made larger. There certainly are some buildings which require provision for growth. [illegible] Hospitals also, school buildings and workhouses accommodate a population which tends to increase. These and residences have usually some free ground about them, and may well be placed on the ground with a view to future extension. A suggestion that the addition should be dotted in on the original plans, to be "helpful to future residents and any architect they may employ" will appeal somewhat coldly to the ordinary architect; but, to one who regards his work as his monument, it may appear a measure of safety worth taking into consideration.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents. but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries-neither do we undertake to answer questions in issue following their appearance.]

"Young Bricklayer": I am interested in brickwork, and would like to see some information on that trade regarding the proper methods of putting in brick footings and foundations, also something on brick bond and bonding, if not asking to much.

Ans.— We can assure "Young Bricklayer", that we are always pleased to answer any questions our subscribers feel inclined to ask, if it is in our power to do



Figs. 1 and 2.

so, and will therefore endeavor to answer the foregoing: A foundation is that part of a structure which acts as a base upon which to erect the superstructure and consists sometimes of brick or stone alone, but, where necessary of concrete and stone, concrete and brick, or concrete alone. The object of a foundation is to spread the weight of the walls over a larger bearing surface than would be covered by the thickness of the walls thus minimizing or preventing unequal settlement. All buildings settle a little, according to their weight, quality of work, thickness of walls and nature of earth on which they rest. It is important that great care be taken in putting down footings and foundations and that the weight be evenly distributed properly over the whole work. Where concrete is employed it should be made of one part cement, two of clear sand, and five of gravel, broken stone or brick. The broken stone, brick or gravel, should be small enough to pass through a one and three-quarter inch ring. The concrete should be gently placed in position to the levels required and become thoroughly set, before the brick or stonework is started. Footings are always the same, whether they be for English, Flemish or any other bond. They are built as far as possible as heading courses in elevation the rule being that the bottom course of footings shall be twice the thickness of the wall intended to be built, each course losing in thickness half a brick successively, stepping off in offsets of 2¼" on each side until the desired thickness of the wall is attained. As an example, a 1½ brick wall will have a bottom course of 3 bricks, the next 2½, the next 2, and then the neat work. It is also advisable that walls of 18" and over in thickness should have the bottom course of footing doubled. Thus a 2 brick wall will have the two bottom courses of footings 4 bricks thick. "Young Bricklayer" will find the following an easy, accurate and quick method of drawing plans, elevations, and sections of footings for all thicknesses of walls. Taking the footings for a 1½ brick wall as an illustration, it being immaterial whether plan, elevation or section be drawn first, it is convenient to start with the section, and from this to draw the plan and elevation. According to the rule, it is evident that the footings with one course of the given wall will consist of four courses, viz., 3, 2½, 2 and 1½ bricks. Draw Fig. 1, centre and base lines AB and CD; upon the centre line mark up the four 3" courses, 1, 2, 3, 4, upon the base-line measure off to the right and left 13½", that is, half the width of the bottom course. Beyond this again on each side, for the sake of construction, allow a distance of 2¼", naming these points E and F. Through point 4 draw the top of the fourth course 6¾" on each side of the centre line; from each extremity of this line, to points E and F draw faint raking lines. From the meeting points of the lines 1, 2, 3, 4, with the raking lines, drop perpendiculars to the lines below. Each offset will then be found to be 2¼". Now fill in each course with 9" stretchers, taking care that whenever a 4½" header is necessary, it shall, when possible, be placed upon the inside of each course.

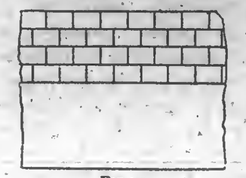


Fig. 3.

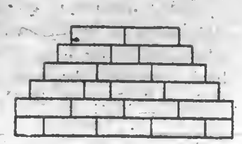


Fig. 4.

Clean out the raking lines, and draw in the concrete as already described.

From the section, the plan (Fig. 2) may then be easily drawn below, and the elevation at the side, as in Fig. 3, taking care that stretchers upon section appear as headers upon plan and elevation, and vice versa and that the courses break joint by 2¼."

Fig. 5.

Fig. 6.

showing the bottom course doubled. The elevation and plan may be taken from it, as in Figs. 1 and 2.

To fully describe the various kinds of bond in brickwork would require more space than is at our command, however, we will offer something on the subject; bond is an arrangement having for its object the massing or building of bricks in such a manner to make them, when so placed or built, act in concert together as a whole. For this purpose no vertical joint of one course should be less than a quarter of a brick from the vertical joint above or below, so that a sharp instrument inserted between two bricks and thrust downward should not be able to penetrate more than the thickness of a brick and a bed joint. This applies not only to face bond, but internal bonding as well. This equalizes the strength of the bearing surface, and transmits the weight downward from one course to another. When bricks are so placed or built together they are termed walls.

The following are the principal kinds of bond, in their order of importance:

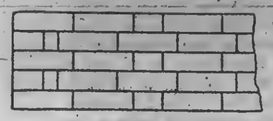


Fig. 7.

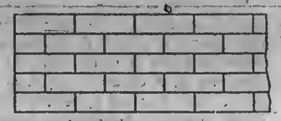


Fig. 8.

English bond, by far the strongest, and, in the opinion of many, the best in appearance, consists of alternate courses of headers and stretchers (Fig. 5.)

Flemish (double); alternate header and stretcher upon the same course and both sides of the wall (Fig. 6.)

Flemish (single); Flemish bond outside with English backing.

Sussex or garden wall; three stretchers and a header alternately upon the same course. Used principally to obtain fair face on both sides of a 9 in. wall (Fig. 7.)

Stretching; stretchers upon each course, for 4½" walls (Fig. 8).

Fig. 9.

Heading; headers only upon each course for circular corners Fig. 9.

Diagonal and herring-bone; as lacing or strengthening courses in thick walls also for flooring (Figs. 10 and 11).

Whenever, in the thickness of a wall, there is an odd half-brick-i.e. 1½ brick, 2½ bricks, then, while laying a heading course on one face, a stretching course should be laid upon the other, the remaining space being filled in with headers laid at right angles with the with the face-line. In the case of quoins, etc., upon the internal angle, the stretcher should quarter bond with and project 2¼" from the heading course which is at right or any other angle to it.

When a wall is an even multiple of a brick in thickness; e.g. 2 bricks, 3 bricks, etc.—then, while a heading course is laid upon one face, a heading course

will be laid upon the other; the same applying to the stretching course, the quarter bonding upon the internal angle being done by means of the header. The ordinary bond used in this country is composed of five courses of stretchers and one course of headers. This makes a fairly strong wall but does not look as well as either English or Flemish bond. It is easier made however, and therefore less costly.

From "Toronto."—How can I make a strong glue that can be held over a fire or flame and then can be applied?

Ans.—There are several kinds of the so-called marine glues that may be used this way. We give a few of them to choose from; (A) naptha, 1 pint; pure rubber, cut into shreds, 1 ounce. Macerate for 10 to 12 days and then rub out smooth on a plate. Then mix 2 parts of shellac with one part of this solution. Melt at about 250 deg. F. for use. (B) Dissolve 10 parts of caoutchouc in 12 parts of refined petroleum, by digesting for 10 days to 2 weeks. Then carefully melt 20 parts asphalt and when melted; pour in the other solution. Keep warm (in hot water), and stir until uniform. These marine glues are very strong.

From "Plumber": Please inform me how I can polish a mable slab that has becomedisfigured and dull?

Ans.—First, rub with a hard stone or marble rubber, and washed flint-grit from the roads (from sieve 16 to the inch mesh), and water, till the sawing or chiselling, as the case may be, is erased; then, with fine white sand, rub till the marks of the road grit disappear; then take a piece of any soft stone of a gond free texture, and rub till the marks from the fine sand are gone; next get a piece of what is known to the trade as second grit, and remove all the scratches caused by the stone, after which rub with snake or fine stone, till upon wiping the face dry a slight polish can be seen. Lastly, get a block of wood for large surfaces, about 16" × 4" × 4", and cover with polishing felt, taking care to stretch the felt thoroughly tight upon one face of the block, which should previously be planed quite straight, and a piece across one end to form two handles. Damp the felt with water, and then dust from a dredger or pepper-box some putty powder on the felt, and commence rubbing. Elbow grease may be applied throughout, as upon it, to some extent, the effect relies. Of course there are (as in all trades) scamping tricks to avoid the labor necessary for good work.

From "Country Builder." Please give a recipe for a good paint for blackboard.

Ans.—There are many recipes for this purpose, but we give you herewith what we consider among the best: Shellac, 1 lb.; bone black, ½ lb.; finest flour emery, 5 oz.; washing blue (powder blue), 4 oz.; and methylated spirit, 1 gal. Place the shellac and spirit together, and shake from time to time till the shellac is dissolved, then add the other ingredients. Each time the mixture is used shake the bottle thoroughly and pour some of the liquid into a shallow can; dip the brush into this and stir round at each application; the emery is so heavy that it settles out rapidly and does not get on to the board unless it is well stirred.

From "A Reader," I read your answer to "Subscriber" last month regarding gelatine moulds, with considerable pleasure as I am interested in such matters, and I make bold to ask you, if there is not some method of making moulds for casting plaster

Ans.—Yes, moulds are often formed in which strong brown glue is one of the main ingredients. We publish a few receipes below:—(1) Soak 1 oz. of glue in 4 oz. of water, add 4 oz. of glycerine and 1 oz. of sugar, and melt with a gentle heat, then stir in 2 oz. of barytes. (2) Take 7 lb. of glue 3½ lb. of resin, 1½ pt. of linseed oil, 3 pt. of water. Soak the glue with the oil, and when cool pour into the melted glue and add sufficient fine whiting to make a stiff, plastic mass. This preparation sets very hard, and must be softened by steaming if not used as soon as made. (3) Take, as in No. 2, 1 lb. resin, 1¼ lb. of best glue, ½ pt. of linseed oil; add fine dry whiting until the proper consistency is obtained No. 3 is a variation of No. 2, gets as hard, and can be made pliable by steaming.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

ANNUAL GENERAL MEETING.

The Association held its 15th annual meeting in the new rooms, in 5 Beaver Hall Square, on Monday 23rd January. The morning session opened at 10.30 a.m. Twenty four members were present, Mr. J. S. Archibald, 1st vice president, took the chair. The assistant secretary read a letter from the president, Mr. Ouellet, regretting the impossibility of his being present, owing to sickness, recommending the candidates for office, nominated by the Quebec members, as having unanimous local support.

The minutes of the last general meeting were read and approved. The Council's Annual Report for 1904, printed copies of which were in the hands of the members present, was taken as read and adopted. It runs as follows :—

GENTLEMEN,—The proceedings of your Council for the year just closed may be summarized thus : (1) Monthly meetings. (2) Library. (3) Scholarship. (4) Recognition of Architectural Degree Established by Schools of Architecture. (5) Publication of Annual Proceedings. (6) Architectural Awards. (7) Tariff. (8) Competitions. (9) Charter and By-laws. (10) Legal. (11) Examinations. (12) Membership. (13) New quarters. (14) Finance.

MONTHLY MEETINGS.—Monthly meetings of the Association were held during the months of February, March, April, October and December, when the following subjects formed the basis of lecture and discussion : February :—Meeting postponed owing to small attendance of members. March :—Address on "The Work of our Association." by J. S. Archibald. April :—Lecture, "Puvis de Chavannes," by Mr. J. B. Lagacé. October :—Business meeting. No quorum. December :—Lecture, "Gothic Carpentry and Joining," by Prof. P. E. Nobbs. The lectures delivered by Mr. Lagacé and Prof. Nobbs were illustrated by stereopticon views.

Your Council feel keenly the continued want of interest shown by the members, and as evidenced by the small attendance at the meetings. Two out of the five meetings had to be postponed owing to small attendance of members. The average attendance of members was only nine (9), a result out of all proportion to the number of members on our roll.

Some expense has been incurred in connection with the meetings and considering the small number that has taken advantage of them the incoming Council should consider whether they would be justified in going to any further expense in the future in connection therewith.

The sincere thanks of the Association is due to those gentlemen who have so acceptably lectured before us during the year.

LIBRARY :—No actual additions have been made to the Library during the year but orders have been placed for the following :—"A Treatise on Architecture and Building Construction," by the International Correspondence Schools ; "Rotch Traveling Scholarship" ; "Les Elements et Theorie de l'Architecture," by J. Guadet.

[illegible] out of the recommendations and resolutions passed with respect to the Scholarship established by the Association in the Architectural course at McGill University. The particulars pertaining to same were fully advertised both publicly and amongst members of the profession. [illegible] opportunity presented for the study of architecture, by the terms of the Scholarship, has not been taken advantage of, no one [illegible]

RECOGNITION OF THE ARCHITECTURAL DEGREE ESTABLISHED IN CONNECTION WITH ARCHITECTURAL SCHOOLS :—In accordance with the resolution passed at the last general anual meeting the special committee have had the subject under consideration and their report will be placed before you.

PUBLICATION OF ANNUAL PROCEEDINGS :—In accordance with the resolution passed at the last annual meeting the Council have had under consideration the advisability of issuing an annual publication. No one questions the desirability of such a move but it has merely resolved itself into a question of ways and means. Arrangements have been completed for the first publication to be issued early in March and at no cost to the Association.

ARCHITECTURAL AWARDS :—The scheme for a system of architectural awards which was adopted, in principle, at last annual meeting, has received the consideration of the special committee but it has been felt that, owing to the want of interest shown by members in the work of the Association, the time is inopportune to proceed further with the idea. We trust that the incoming Council may receive such a measure of support as will warrant them taking up the matter again.

TARIFF :—The question of the desired amendments to our tariff has been engaging the serious attention of the Council during the past year. It has been felt that when the time is opportune wherein to present to the proper authorities the amendments which we desire to make, that the amendments be of such a character as to cover the question, in its entirety, for years to come. With that end in view, we have been and are in communication with several architectural bodies, exchanging views on the subject and getting all necessary information in order to strengthen our case at the crucial time. The matter is now reaching that condition when we may be able to take the matter up with the Provincial Cabinet.

COMPETITIONS :—In accordance with the resolution passed at the last annual meeting, the question of competitions has received the careful consideration of the Council. After studying the competition codes promulgated by the leading societies of the world, your Council drafted a code adapted to our particular case. A general meeting of the Association was called on the 18th of October, to consider and discuss the said code, but no quorum was available. The code will be laid before you at the annual meeting.

CHARTERS AND BY-LAWS :—In accordance with the resolution passed at the last annual meeting, your special commitee have had under consideration the question of amendments to the Charter and By-Laws. The report will be laid before the meeting.

LEGAL :—In order to exercise a thorough supervision over all legislation affecting our profession, both civic and provincial, the Council deemed it advisable to subscribe to the *Montreal Municipal Gazette* and the *Quebec Official Gazette*. These are kept on file and each issue carefully examined. The prosecution of persons practising illegally has been receiving the attention of the Council. Actions have been taken in two cases but as they are still pending further comment is impossible. In conformity with the desire expressed at the last annual meeting with respect to the amendments to Article 1688 of the Civil Code, as to responsibility of architects, and in continuity of the policy established by the former Council, your Council took and carried on the work begun by the former. Several joint meetings were held with the Builders' Exchange and representation was made before the Government in Quebec. A certain measure of relief was offered, but acting under the advice of our legal advisor, and which was in conformity with our own opinion, it was unanimously decided to refuse the amendment offered by the Government. We trust to be able to establish our contention and gain our point at some other time.

EXAMINATIONS :—At the January examinations Mr. G. E. Labelle [illegible] Montreal, was admitted as student in Architecture, and at the July examinations Mr. L. E. Auger, from Levis, was registered as Architect.

[illegible] by members, the following having been added since the beginning of the year :—Messrs. Charles Follen McKim, William Rutherford Mead and Stanford White were registered members of this Association upon credentials as members of the American Institute of Architects. [illegible] this opportunity to record the loss our Association has sustained in the departure, from our midst, of Mr. A. T. Taylor. Mr. Taylor was a member of the profession and Association, sparing neither time nor trouble in order to advance the interests of all. His loss to the Association will be keenly felt.

NEW QUARTERS :—The Association has taken up new quarters since our last meeting. We are much better arranged for work and study, and at practically no greater expense. We trust full advantage will be taken of the increased facilities afforded.

FINANCIAL :—The Council wish to draw the attention of the members to the fact that every year large numbers are in arrears. The Council wish to impress upon members that those in arrears on the 31st of December have no right to vote.

ATTENDANCE AT THE MEETINGS OF COUNCIL. 18 meetings.

J. P. Ouellet	President	Quebec	2
J. S. Archibald	1st Vice-President	Montreal	16
A. Chaussé	2nd Vice-President	"	11
J. E. Vanier	Secretary	"	10
D. R. Brown	Treasurer	"	10
W. E. Doran	Councillor	"	7
R. P. Lemay	"	Quebec	1
J. Z. Resther	"	Montreal	7
J. W. Carmichael	"	"	6
A. A. Cox	"	"	5
Jos. Venne	"	"	10

It is to be noted that Messrs. J. P. Ouellett and R. P. Lemay, being from Quebec, could not attend the meetings.

J. E. VANIER, Secretary. JOS. P. OUELLET, President.

Montreal, January 16th, 1905.

J. E. VANIER, ESQ., Architect,
Secretary "P.Q.A.A.," Montreal.

SIR,—The undersigned, Officers of the Quebec Section, "P.Q.A.A.," herewith have the honour of submitting to the Council the annual report of said Section, for the term 1903-1904.

The election of officers took place at Quebec's City Hall, on the 23rd of December, 1903 ; Mr. Thomas Raymond was elected President, to replace Mr. R. P. Lemay, and Mr. Jos. P. Ouellett was re-elected Secretary and Treasurer.

The Quebec Section was increased by one member this year, Mr. L. Auger, who was admitted to practice at Montreal in July last.

Two candidates tried this year, at Quebec, the examinations for studentship, but they failed.

The Quebec Section has not yet succeeded in having the proposed regulations for building construction adopted for Quebec, specially due to changes in the Municipal Council and to general elections.

The Quebec Architects have worked in the Local House the adoption of amendments to the law relating to the responsibility of Architects and Contractors in the Province of Quebec ; but on the decision of the Council of the P.Q.A.A., they let the bill drop, to take the matter under more favorable circumstances.

The whole respectfully submitted.

JOS. P. OUELLET, Sec. S. de Québec. THOMAS RAYMOND, President.

Quebec, January 5th, 1905.

The treasurers report then came before the meeting in the following form :

TREASURER'S REPORT.

RECEIPTS.

Balance on hand January 1st, 1904		$1,044 75
Arrears for 1903 and previous year	$410 00	
Annual subscription for 1904	800 00	
Registration fees	125 00	
Examination fees	40 00	
Ten tickets to Quebec	45 00	
Banquet at Quebec	60 00	
St. James Literary Society	50 00	
Furniture Sold Drug Club	31 60	
Interest, bank account	43 20	1,604 80
Total		$2,649 55

EXPENDITURE.

Returned to Quebec Section for 1904	$65 00	
Salary of Assistant Secretary	360 00	
[illegible]ding taxes	379 26	
Cleaning rooms and rugs	22 25	
Moving expenses	24 63	
Ten tickets to Quebec	45 00	
Monthly meeting expenses	22 00	
[illegible]		
Insurance	3 70	
[illegible]	61 00	
Assistant Secretary's expenses to Quebec	14 25	
Lighting account	11 72	
[illegible]		
Dinner, Chateau, Quebec	73 25	
[illegible] printing, stationery	18 00	
Examination fees	100 00	
Architectural journals	28 [illegible]	
Law books	3 75	
Advt. in Official Gazette	6 18	
Transferred to the Library Fund	100 00	$1,605 23
Balance in bank January 1st, 1905		1,044 32
Total		$2,649 55

STATEMENT OF LIBRARY FUND.

Balance on hand January 1st, 1904	$110 17	
Transferred to Library Fund, rent from St. James Literary Society for 1903 and 1904	100 00	$210 17

STATEMENT OF SCHOLARSHIP FUND.

Balance on hand January 1st, 1905	$600 00	

BALANCE SHEET OF CAPITAL ACCOUNT.

Furniture and office fittings	$554 13	
Electric lantern fittings	114 50	
Library	1,200 00	
Fees due for 1903	40 00	
" " 1904	320 00	$2,228 63
Cash in bank : General Fund	$1,044 32	
Scholarship Fund	600 00	
Library Fund	210 17	1,854 49
Total		$4,083 12

D. R. BROWN, Treasurer.

We the undersigned auditors having examined the books and vouchers find the above statement correct.

(Signed) L. LEMIEUX
(Signed) PERCY E. NOBBS.

Montreal, January 16th, 1905.

Mr. W. E. Doran pointed out that the sum of $600 which had been voted as a Scholarship Fund, although it had not been awarded to any student, was not properly included as assets, and moved that it should be transferred to the liabilities. The motion was seconded by Mr. Hutchison and passed. Mr. Doran further pointed out that as the present form of the charter made it practically impossible to recover the subscriptions in arrear for 1903 and previous years, these were practically, though not technically, bad debts, and the Association must be considered as living beyond its income. The treasurer's report as amended being then adopted, the Association proceeded to the election of office bearers.

MR. JOHN S. ARCHIBALD,
President Province of Quebec Association of Architects.

Mr. A Chaussé, 2nd vice-president, taking the chair, moved that Mr. J. S. Archibald take the chair as president, being elected by acclamation. Mr. J. S. Archibald, president, in the chair, the following were elected:

1st vice-president, Mr. Alcide Chaussè (by acclamation); secretary, Mr. J. E. Vanier (by acclamation); 2nd vice-president, Mr. R. P. Lemay, Quebec; treasurer, Mr. D. R. Brown (by acclammation).

Mr. Doran asked to have his name withdrawn from the list of candidates for the council, having now served 6 years as councillor.

The councillors elected were :—Mr. Jos. Venne, 21 votes; H. W. Davies, 19 votes; L. A. Amos, 18 votes; J. Z. Resther, 16 votes; J. R. Gardiner, 15 votes.

The Reports of the Special Committees were then submitted to the meeting.

The Special Committee, formed to report regarding the conduct of Architectural competitions, laid before the meeting a Code to Regulate Competitions. The report, after being discussed paragraph by paragraph, was adopted in the following amended form. The adoption was proposed by Mr. Jos. Venne and seconded by Mr. L. A. Amos.

CODE FOR THE CONDUCT OF ARCHITECTURAL COMPETITION.

It is to be understood that the P.Q.A.A. issue these suggestions as a guide to promoters, where a competition has been decided upon, but not necessarily recommending the principle of competition.

Competitions, under certain conditions, being inevitable, the Province of Quebec Association of Architects, following in this, the example traced by most eminent bodies of the profession such as the Société Centrale des Architectes de France, the Royal Institute of British Architects, the American Institute of Architects, and many others, have formulated the following code, based on the standard set by aforesaid institutions.

1. Competitions should not be called for on a building already in the hands of an architect, and being actually in course of construction.

2. Competitions are not admissible for buildings of a mercantile character, stores, dwellings, etc. They are also objectionable on small commissions.

Competitions may be admissible for public buildings or those of a novel or special character.

3. The promoters of an intended competition should, at the outset, appoint one or more professional assessors, architects of established reputation, whose appointment should be published in the original advertisement and instructions, and whose decision should govern the selection of the design.

The president and members of council of the P.Q.A.A. will always be prepared to act as honorary advisers to promoters in their selection of an assessor.

4. DUTIES OF ASSESSORS.—The duty of assessors should be:

(a) To draw up the particulars and conditions of the competition, in accordance with the principles set forth in this code, as instructions to competitors and also to advise upon the question of cost.

(b) To determine whether the designs submitted conform to the instructions and to exclude any which do not. When no design conforms to the express instructions they should all be excluded. (c) To advise the promoters on the relative merits of the designs submitted in the competition, and to make a selection in accordance with the conditions.

An assessor must be a disinterested party, and must abstain absolutely from competing and from acting as architect, directly or indirectly, for the proposed building, or subsequently as consulting architect during the carrying out of the work.

Every promoter and every employee of either the assessor or the promoters, must be excluded from the competition.

DESIGN EXCLUDED.—A design should be excluded from the competition for any of the following causes:

(a) If sent in after the period of date named (accident in transit

(b) If it does not substantially afford the accommodation asked for in the instructions given to competitors.

(c) If it exceeds the limit of site of floor areas called for by the instructions. The sizes of these should be determined by the assessors.

(d) If the assessor should determine that the probable cost will materially exceed the outlay stated in the conditions of competition. The question of cost may be a material element in the consideration of an award, but competitors should not be expected to furnish guaranteed estimates, neither should they be bound to more than about 15 per cent. above or under the named valuation.

CLASSES OF COMPETITION.—Competitions for the selection of an architect may assume one of the following forms:

(1) "Limited"—To a certain number of architects, each of whom is invited to take part.

This form is not specially recommended as it deprives the promoters of the principal benefit supposed to arise from a competition, viz: The selection of the best idea possible.

It may be advisable in special problems where expert knowledge is desirable.

(2) "Open"—To all who desire to enter.

The most desirable form of competition, specially for public buildings.

(3) In cases of local or national competitions, it is not considered a limitation to exclude strangers to the locality: for instance cities might limit competitions to their citizens, provinces to their residents, or organizations to their members.

PAYMENT.—Competitions being additional work to architects, of an extraordinary character, and for the express benefit of the promoter, should be paid for independently of, and in addition to the usual schedule of charges.

In all competitions the first prize, in addition to the premium, shall be the award of the commission to design the building and superintend its construction; and the programme should definitely state that the successful competitor will be so retained, and that he will be paid for his services, at the rate established by the P.Q.A.A.

These conditions being set forth, payments to competitors may be as follows:

(a) In limited competitions each competitor should be paid a fixed sum.

(b) In open competitions there should be a number of premiums stipulated, and to be paid in addition to the professsonal charges for carrying out the work.

(c) The assessor is the competent person to fix the amount to be paid as a premium.

DRAWINGS.—The number and scale of the drawings required should be distinctly set forth, and they should be not more in number or to a larger scale than necessary to clearly explain the design. Perspective drawings are not necessary, but if the assessor advises that they are desirable, it should be so stated. However, when perspectives are not called for, they should not be considered as an infraction of the programme, and shall not cause the competitor to be excluded, as the nature of his design may, to his mind, necessitate the perspective.

Drawings should be of uniform size. Mode of coloring, mounting, and framing to identical. This should be distinctly stated in the programme.

No design should bear any motto, device or distinguishing mark; but all designs should be numbered by the promoter or by the assessor, before being opened.

Any attempt to influence the decision of the promoters or the assessors should disqualify a competitor.

Each design should be accompanied by a declaration, signed by the competitor, stating that the design and drawings have been prepared in his own office and under his own supervision.

EXHIBITION.—It is desirable that all designs admitted in a competition, should with the consent of their authors, be publicly exhibited after the ward has been made, which award should be published at the time of the exhibition.

COMMISSION ALLOTTED.—The Architect, whose designs may be selected as the best, shall be employed to carry out the work. If no instructions are given him to proceed within twelve months from the time of selection, he should receive compensation according to the schedule of charges established by the P.Q.A.A., which sum is to be merged in the usual professional charge when the completion of the design is proceeded with.

CONDITIONS.—The conditions of the competition should be drawn up so as to form a contract. They should:—

(a) Name the owner of the structure forming the subject of the competition, state whether he intends to conduct the competition personally or through representatives. If the latter, name the representatives, state how their authority is derived and define its scope.

(b) State the kind of competition to be instituted, and in limited competitions, name the competitors; or in open competitions, if the competition is limited geographically or otherwise, state the limits.

(c) Fix a definite time and place for the receipt of the designs. The time should not be altered except with the unanimous consent of the competitors.

(d) State the (approximate) limit of cost, if fixed; the desired

accommodation and the conditions of the site, giving a plan and profiles of the ground. In some very important competitions, it is desirable to give raised models of the grounds.

(e) Fix the uniform requirements for the drawings, giving the number of drawings, the scale, and the method of rendering. (Only the strict requisites should be asked for.)

(f) State whether the submission of more than one design by a competitor is forbidden or allowed.

(g) Name the judge or jury. Define his or their power.

(h) Provide that during the competition there shall be no communicating upon anything relating to the competitions, except in writing, between any competitor, on the one hand, and the owner or representative of the owner, the professional assessor or any juror, on the other; and that any information, whether in answer to enquiry or not, shall be given, in writing, simultaneously to all competitors.

Fix a date after which no questions will be answered.

(i) Provide for the placing out of competition any drawing which violates the terms, or any set of drawings whose authors have so far disregarded the terms as to deserve the extreme penalty.

(j) Fix the number, nature or amount of the awards.

(k) State whether the assessor (or professional jury upon vote) is to make the award.

(l) Fix the period of time wherein the final decision will be rendered.

(m) Provide for sending the decision and a copy of the report of the professional adviser or of the jury to each competitor.

(n) Provide that no drawings shall be exhibited or made public until after the award.

(o) Provide for the return of unsuccessful drawings to their respective authors within a reasonable time, and provide that nothing original as to this competition in such designs shall be used without compensation to the author of the design in which it appears.

The discussion on the above report was taken part in by Messrs. Doran, Hutchison, Gauthier, Amos, Nobbs and others. Mr. Doran strongly objected to the general principle of competitions and insisted on the necessity of adequate compensation for all work done. The clause regarding remuneration for competitive drawings called forth a good deal of discussion, Mr. Gauthier contending that these should be considered as something more than preliminary sketches, Mr. Doran suggesting that competitive work should be made to include working drawings and specifications and that these should be paid for at the usual rates.

At the afternoon session, which opened at 3 o'clock, Mr. J. S. Archibald, President, in the chair, there were seventeen members present. The Special Committee, appointed to make a report on the amendment of the Charter & Bye-Laws, submitted to the meeting certain amendments, prepared by the legal adviser of the Association, M. Beauduin. It was pointed out by the President that, owing to the great difficulty experienced in enforcing the rights of the Association under the charter as at present made out, it was felt necessary to have the charter made in some way more effective. That, although the charter was intended to give the Association the power to prevent unqualified persons

[illegible] port of the charter, but were simply a means of making the charter efficient. After discussion, in which Messrs. Venne, Hutchison, Vanier and others took part, it was proposed by Mr. Hutchison, seconded by Mr. Lemieux, that the suggestions of the legal adviser of the association be adopted and presented to Legislature during the present session or the next.

The following is the Report of the Committee on the above matter :—

REPORT OF LEGAL COMMITTEE.

MONTREAL 10TH. NOVEMBER, 1904.

TO THE MEMBERS OF COUNCIL: In accordance with the instructions received, your committee have taken into consideration the resolution passed at the last annual meeting with respect to preparing "a scheme of amendments to the charter, if necessary, and to part of the by-laws concerning the election of officers and council," and now beg to report as follows:

1st. With respect to the Charter:

Your committee having met with difficulties in the endeavor to enforce certain clauses of the charter, requested your legal adviser to draft certain amendments pertaining to the instituting of actions for illegal practising and for collection of arrears. We append for your consideration, the said amendments.

Your committee having carefully considered the clauses of the charter, in all its bearings, and the suggested amendments, after mature consideration, have come to the decision that they are entirely inadequate and fall far short of the requirements. The charter safeguards neither the interests of our profession nor those of the public.

Some radical amendments are necessary in order to gain this desired end, but after our previous experience, we consider that it would be impossible to get the necessary legislation by means of a private bill. We recommend that steps be taken to bring the matter before the Government of the day and that all due pressure be brought to bear upon them, in order that the Government may recognize the importance of the subject as one not merely affecting the interests of our profession but the wider field of public good, and be influenced to take up the matter as a public measure, as it is essential that the same standard of efficiency should be established by law in architecture as is required in the other learned professions.

2nd. With respect to the amendments to by-laws governing election of officers and council.

Your committee have carefully considered the said by-laws and while acknowledging that there is room for improvement, we do not consider the present an opportune time to make any change in same.

Reported by,

Respectfully yours,

(Signed) J. S. ARCHIBALD.
W. E. DORAN.
J. E. VANIER.

PROPOSED AMENDMENTS TO CHARTER REFERRED TO IN FOREGOING REPORT.

The second paragraph of section 13 is replaced by the following:

Any person who, after the time above mentioned, not being registered as a member of the said Association, takes or makes use of any such name, title or designation, as above mentioned, is liable to a fine not exceeding twenty-five dollars for the first and not exceeding one hundred dollars for every subsequent offence.

13a. Prosecutions undertaken for the recovery of the fines imposed in virtue of said law can be instituted by the Association or any individual before the Judge of Sessions, the Police Magistrate, or the Recorder, in the cities of Montreal and Quebec; or before a District Magistrate or a Justice of the Peace at the place where the offence was committed in other parts of the provinces; or before any other competent court of justice of the locality where the offence was committed, by simple civil action in the ordinary manner.

13b. In default of immediate payment of the fine and the costs, these shall be levied by way of execution and sale of [illegible] officers to pay them the defendant shall be incarcerated at the common jail of the district for a period not exceeding ninety days unless the fine and costs shall be [illegible] sooner paid.

13c. In all prosecutions instituted in virtue of article 13 it [illegible] to produce proof of his right to [illegible] the profession of Architect or to take one of the titles mentioned in said article.

13d. Any person otherwise competent to render evidence in an action of prosecution in which the corporation is a part, shall not be held to be incompetent by reason of the fact that he is a member or officer of the corporation.

13e. In all prosecutions instituted in virtue of clause 13 for

recovery of the fines imposed, the proof of the offence can be established by the evidence of a single witness.

13f. All fees, penalties, and fines recovered in virtue of section 13 of this act shall be the property of the Association of Architects of the Province of Quebec, and shall become part of the general funds.

The Special Committee on the recognition of degrees to be given by schools of architecture then submitted the following report :—

REPORT OF THE COMMITTEE NOMINATED BY THE COUNCIL TO CONSIDER THE MOTION OF JANUARY 28, 1904, BY MR. W. E. DORAN, TO ADD TO BYE-LAW 8.

Motion.—It is moved by Mr. W. E. Doran, seconded by Mr. J. S. Archibald, to add to bye-law 8.

"Candidates for admission to registration as architects who have graduated from recognized schools or colleges of architecture after a full course of four years and who shall present certificates of having successfully passed at such schools or colleges their final examination in any of the subjects prescribed by this bye-law shall be exempted from further examination in such subjects."

After discussing Mr. Doran's motion and considering that the said motion might infringe certain privileges of the association.

It was moved in amendment by Mr. Raoul Lacroix seconded by Prof. P. E. Nobbs and carried :

That the question be referred to a special committee to be nominated by the council and to contain the proposer and seconder of this amendment who shall report to a general meeting of the association.

The committee begs to report in favor of the proposed amendments to bye-law 8, on the ground that subjects prescribed for the final examination of the Province of Quebec Association of Architects are covered on a satisfactory standard by certain college courses in Architecture.

The committee further recommends

(1) That graduates of recogoized architectural colleges shall be required before admission to have passed at least one year in an architect's office subsequent to graduation.

(2) That further test of such practical knowledge as is required for the profession of architecture be instituted with the final examination of the Province of Quebec Association of Architects.

Mr. Jos. Venne strongly opposed the suggestion that graduates from recognized schools of architecture should be entitled to become members on presentation of their diplomas and a further examination in practical matters. He pointed out that this would mean a delegation to the other organizations of the right to set the standard in certain subjects for admission to the Association, and that, however high the standard aimed at by these organizations might be, it was unreasonable to expect any association to relinquish so far the control of the entrance to its own membership. If the standards proposed were higher than those required by the association, there would be the less difficulty encountered in passing these by students who had graduated at the schools. He would have no objection to exempting such students from paying unnecessary fees in such circumstances.

Prof. P. E. Nobbs said the clause in question was introduced in the hope of encouraging architectural students to undergo a systematic training and thereby raise the whole standard of architectural education. The Association at present did nothing for architectural education. He strongly urged the establishment of definite relations between the Association and the schools of architecture in the Province. Amongst others his own department at McGill University would, he felt, incidently receive much encouragement from being brought into that practical touch with the profession in the city which the cause aimed at. The mere passing of the examination set by the Association was not the unique qualification for membership that Mr. Vennes view seemed to imply. The recent admission of Messrs. McKim, Meade and White was made very properly on their credentials, and, though it might be arguing somewhat from great things to small, he thought that students who devoted four sessions to a special study of their profession, passed a recognized standard of efficiency, and then underwent a period of practical training in an office, held credentials of a much more satisfactory nature than the passing of the entrance examination could afford.

Mr. Hutchison thought students with a training of an architectural school must acquire a more liberal education than could be picked up in offices or gathered by private study at home.

After some discussion, a motion, made by Mr. Jos. Venne seconded by Mr. Heriot, "that the Report be laid on the table", was carried.

On a motion of Mr. Jos. Venne seconded by Mr. J. E. Vanier it was resolved that the $600, set aside for Scholarship Fund but not awarded, should be replaced in the General Fund.

It was resolved on a motion by Mr. Jos. Venne seconded by Mr. Alcide Chaussé that the next annual meeting be held at Quebec.

STANDARD SIZE OF BRICK.

In 1902 a Conference of Architects, Engineers and Builders and Makers was held, and adopted a length equal to two widths, plus one joint, and brickwork in height should measure four brick and four joints per foot.

NEW PAVILION FOR TORONTO.

The Toronto City Architect has prepared two plans for a new pavilion in the Horticultural or Allan Garden, to replace, on the same site, the old pavilion which was destroyed by fire. The first plan estimated to cost $200,000, has a hall to seat 1,350 persons, with cloak rooms at the entrance and an upper storey containing supper rooms and a kitchen. The other plan, estimated to cost $130,000, will seat only 1,070 and the supper rooms are in the basement. The old pavilion seated 1,800, and the Toronto public has not decreased since it was in use.

NEW POST-OFFICE AT TORONTO.

Sir William Mulock, Postmaster-[illegible] Front street will occupy a strip of land beginning at the south-east corner of Bay and Front streets, extending eastward a distance of 250 feet and to the south as far as the railway tracks. An agreement on this site has been reached between the Post-office Department and the Grand Trunk Railway Company.

Milton

High-Grade Pressed and Ornamental Bricks in red, buff, yellow, salmon, brown, and Special shades.

DR. ROBERTSON, PRESIDENT. J. S. McCONNELL, MANAGING DIRECTOR.

ARCHITECTURAL TERRA COTTA

We make a Specialty of Ornamental Brick and Terra Cotta Mantels

Pressed

Our products have a wide reputation and are specified by leading architects

THE MILTON PRESSED BRICK CO., LIMITED

Bricks

Works and Head Office: MILTON, ONT.

Montreal Agents: T. A. MORRISON & CO., 204 St James Street

CANADIAN CONTRACTOR'S HAND BOOK AND ESTIMATOR

The third edition of the Canadian Contractors' Hand-Book is now on sale. The book has been revised and enlarged to upwards of two hundred pages, and the title changed to the Canadian Contractor's Hand Book and Estimator considerable matter bearing on the cost of performing various kinds of work hav-

[illegible] to subscribers of the CANADIAN ARCHITECT AND BUILDER, and $1.50 [illegible] Order from the publishers.

The C. H. Mortimer Publishing Co. of Toronto, Limited

Confederation Life Bldg., Toronto
Alliance Building, Montreal
720-721 Union Bank Bldg., Winnipeg

CONCRETE BLOCK MACHINES

We are prepared to supply the public with the most perfect working machine on the market, and at such a price that is within the reach of anyone contemplating starting the manufacture of Concrete Building Blocks.

ALSO, CISTERN AND PIPE MOULDS, EXCAVATING MACHINES.

Correspondence Invited.

CONCRETE BLOCK MACHINE CO.
32 CHURCH ST., TORONTO

MANTELS - GRATES - TILES

Brick, Tile, Wood } Mantels

Artistic, Everlasting, Sanitary } Tiles

Coal, Gas, Open Fireplace } Grates

FIRE PLACE FURNITURE

Andirons, Fire Screens, Fenders, Fire Screens, Tongs, Shovels, &c.

COAL AND WOOD BASKETS

VISIT OUR SHOWROOMS

THE Vokes Hardware Co. LIMITED

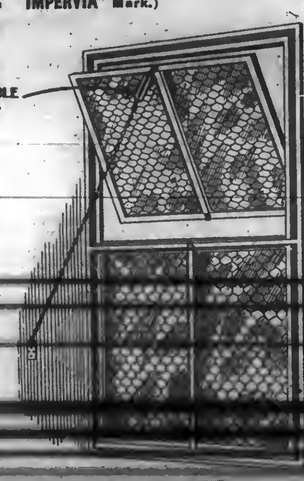
111 and 113 Yonge Street, TORONTO

AN ABSOLUTELY FIRE-PROOF WINDOW

Registered Trade "IMPERVIA" Mark.)

NOTICE THAT LINK!

FUSIBLE LINK



It melts at 160°, thus allowing the window to close and lock automatically

IT NEVER FAILS

Hollow Sheet Metal Sash and Frame, Glazed with Wire Glass

We make them to suit your requirements

Let us [illegible]

Made of Galvanized Sheet Steel or Cold-Rolled Sheet Copper

The Metallic Roofing Co., Limited
WHOLESALE MANUFACTURERS
TORONTO, MONTREAL, WINNIPEG

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1904.

PRESIDENT	JOHN GEMMELL, Toronto
1ST VICE-PRESIDENT	J. W. SIDDALL, ,,
2ND VICE-PRESIDENT	A. R. DENISON, ,,
TREASURER	HENRY SIMPSON, ,,
REGISTRAR	W. R. GREGG, 96 King St., Toronto

COUNCIL:

JOHN GEMMELL	Toronto
HENRY SIMPSON	,,
J. W. SIDDALL	,,
W. R. GREGG	,,
S. G. CURRY	,,
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1904.

PRESIDENT	J. P. OUELLET, Quebec.
1ST VICE-PRESIDENT	J. S. ARCHIBALD, Montreal.
2ND VICE-PRESIDENT	A. CHAUSSE, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. R. BROWN.

P.Q.A.A. COUNCIL.

W. H. DORAN	Montreal.
R. P. LEMAY	Montreal.
J. Z. RESTHER	Montreal.
W. J. CARMICHAEL	Montreal.
A. A. COX	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DUTEIS, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
T. MARTIN.
CANNON, Jr.
R. G. KIRBY.

Exhibition Board—RICHARD G. KIRBY.

LONDON BUILDERS' EXCHANGE

J. C. [illegible], President.
JOHN NUTKINS, 1st Vice-President.
[illegible] BUTLER.
THOS. JONES.
GEO. S. GOULD, Secretary-Treasurer.
GEO. YOUNG
S. STAVELY.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS.

E. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADLEY
C. P. SHINOLER
K. M. FRASER.
E. O. BATNES
D. SAULT.

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
R. S. HARRISON, Angus Browne, W. A. Irish, D. Cameron, John Douglas, J. W. Morley, Thomas Cotter, J. A. Girvin, R. Watson, Victor Bouche, William Alsip, and C. H. Simpson.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
G. J. SHEPPARD, Secretary-Treasurer.
J. H. HUTCHISON.
JOHN DUTHIE
P. LAMER
JOSEPH LAMBERT, Jr.
JAMES H. MARES.

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
83 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, Jr., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGRAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE
LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
R. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

An amalgamation has been made between the offices of Messrs. Sproatt & Rolph and S. G. Curry, Toronto. The combination will be known as Sproatt & Rolph, architects, S. G. Curry, consulting architect.

There are some 25 firms comprising the list of architects in South Africa and of these 13 are in the Transvaal. Most of the names have the letters F.R.I.B.A. or A.R.I.B.A. after them so that the country may be said to have a good start in the way of architects. The native style, if it has any real expression, except in houses like that of Cecil Rhodes, where, for purposes of sentiment the most is made of what style there is, is not particularly expressive, but they have that great advantage for architectural style a definite climate which, if it has extremes has them only on one end of the thermometer; not like ourselves who combine the climates of the extreme limits of Russia on one parallel of latitude.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

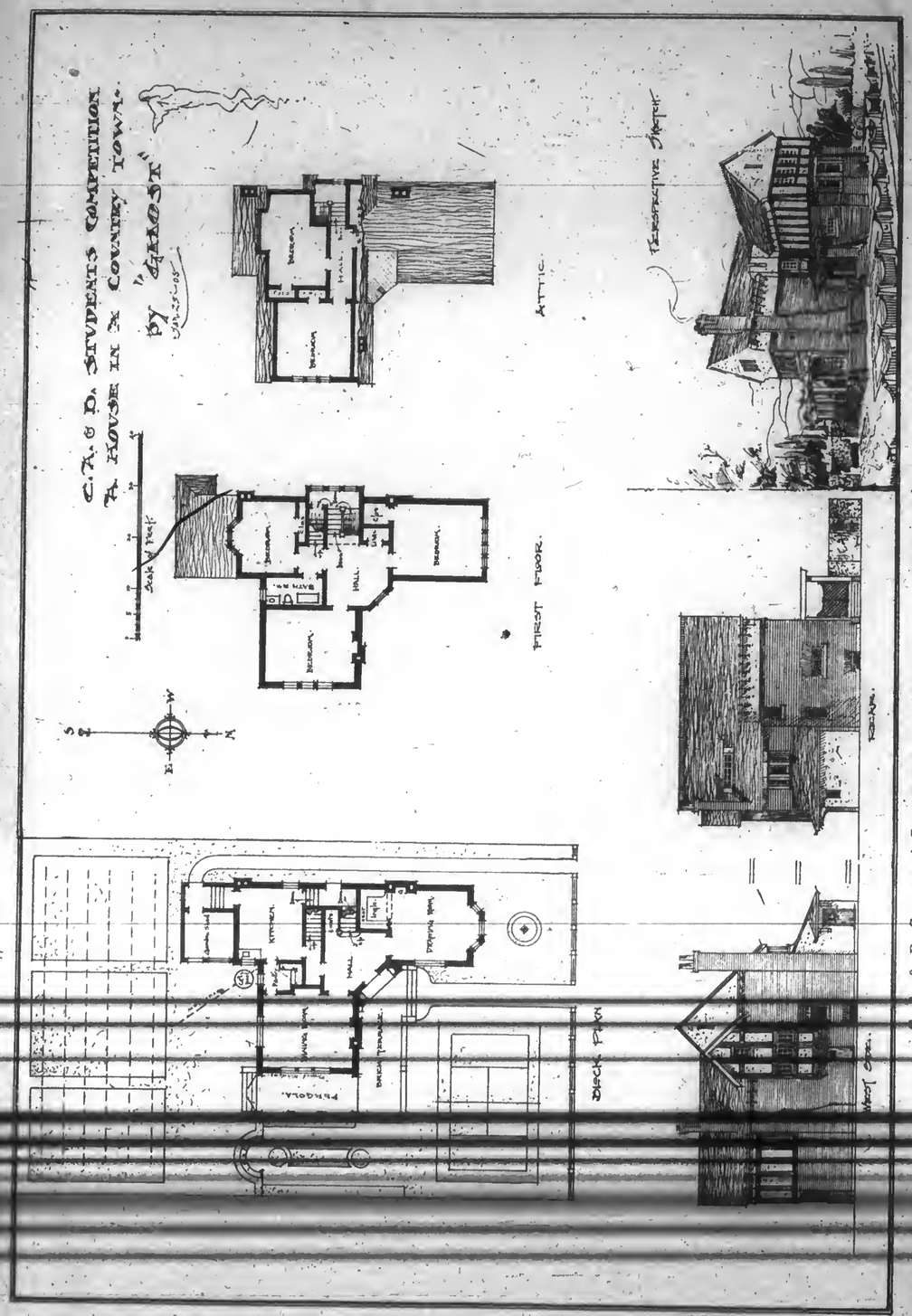
IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices



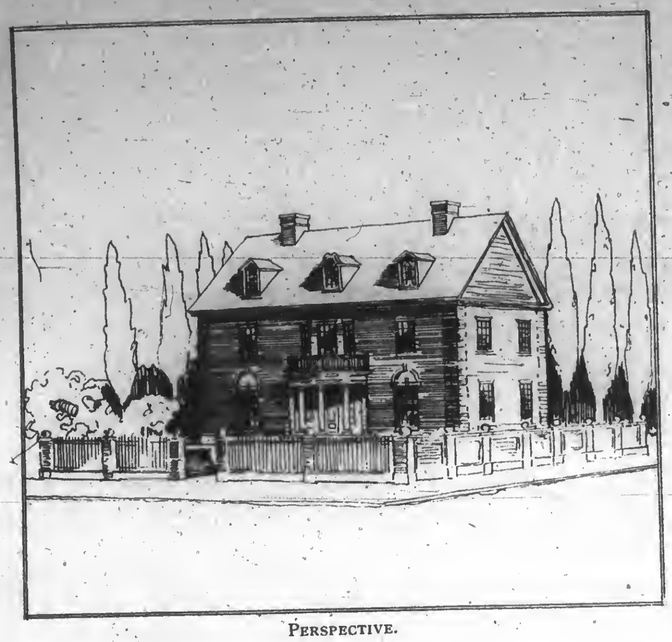
C. A. & B. STUDENTS' COMPETITION. DRAWING BY "GHOST," MR. W. B. VAN EGMOND.
AWARDED FIRST PRIZE.

SUPPLEMENT TO THE CANADIAN ARCHITECT AND BUILDER, FEBRUARY, 1901.

BLACKWELL'S ISLAND BRIDGE, EAST RIVER, NEW YORK. MESSRS. PALMER & HORNBOSTEL, ARCHITECTS, NEW YORK.

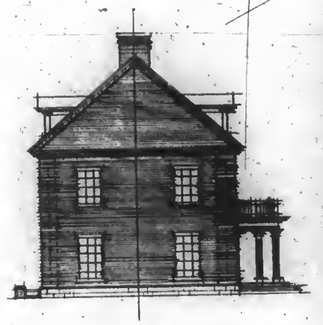
Reproduction of a portion of drawing in the Eighteen Club Exhibition, Toronto.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER,
FEBRUARY, 1905

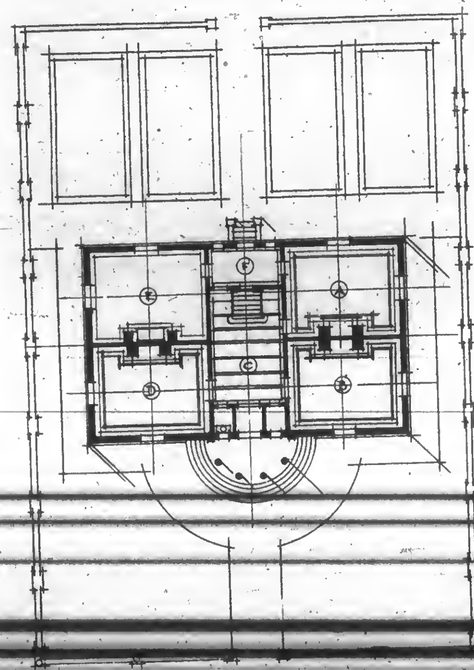


PERSPECTIVE.

SOUTH ELEVATION.

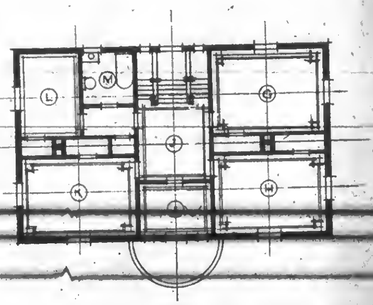


EAST ELEVATION.



FIRST FLOOR PLAN

A. DINING ROOM
B. PARLOR
C. HALL
D. LIBRARY
E. KITCHEN
F. PANTRY



G. CHAMBER
H. CHAMBER
I. SITTING RM
J. HALL
K. CHAMBER
L. CHAMBER
M. BATHROOM

C. A. & B. STUDENTS' COMPETITION. DRAWING BY "COLONIAL," MR. S. DOUGLAS RITCHIE.
AWARDED SECOND PRIZE.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.

OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 207. MARCH, 1905.

ILLUSTRATIONS ON SHEETS.

Cottages on the Estate of Charles Francis Adams, from the Brickbuilder.
English Cottages—From The County Gentleman.
House on Manning Ave., Toronto. Messrs. Chadwick & Beckett, Architects.
House for Mr. I. C. Chambers, Winnipeg. F. R. Evans, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Front of St. Augustine's Church, Pittsburg. Messrs. Rutan & Russell, Architects.
Drawing by Mr. Wilson Eyre in the Eighteen Club Exhibition.

CONTENTS

Editorial	33-34	Peterboro's Plumbing Inspector	ix
Marsh's Reinforced Concrete	35	St. John, N.B., Painters' and Decorators' Association	ix
Books	36	Scientific Choosing of wall Paper	ix
Our Illustrations	37	Hamilton Paint Shops Will be Open	ix
Architectural Accoustics	38-39	Toronto Man Vice-President	ix
Mission Furniture	40	A Satisfactory Investment	ix
The Coloring of Concrete	41	Montreal Painters' Annual Meeting	ix
Intercommunication	45-43	Toronto Builders' Exchange	x
Forfeiture Clauses in Building Contracts	44	London Builders' Exchange	x
Montreal Correspondence	45	Winnipeg Notes	xi
A Municipal Lodging House	ix	Building Boom in Montreal	xii
What the American Institute of Architects Is	ix		

A Plan for Toronto.

At a meeting of the Canadian Institute on March 18th, Mr. J. P. Hynes read an interesting paper on the subject of civic improvements, with special reference to Toronto. Many lantern slides were shown, of improvements in other cities. Those in the United States come nearest to the case of Toronto, and especially in the cities of Cleveland and Buffalo, which like Toronto are situated on a lake and have their railroad approach along its shores. Thus the railway stations and the boat landings are in the same quarter, and it is both convenient and striking to combine them so as to make one grand "Entrance" to the city. In Cleveland they have arranged to group the principal public buildings at this spot, and Buffalo is going to do so too; making of the whole a distinct and ornamental "Civic Centre". This, which was the starting point of Mr. Hynes' lecture, was not received without some opposition, in the discussion which followed.

The truth is that there is some danger in plumping a city's principal buildings upon a site so close to a railroad; especially in combination with a park space, for which, even more than for fine buildings, smoke and cinders are contra-indicated. It was not, however, on this ground that the objection was raised, but on the more subtle but stronger ground of its crudity. The World's Fair undoubtedly started the idea of city planning, but it can hardly be taken as a model of how to proceed. Display is not the happiest end of beauty; and it is not unlikely that the generations to which the United States are working up will wish their ancestors had had a more engaging conception.

The task of city planning is something more difficult than this sort of Beaux Arts project. It is a process not of creation but of development. There are, it is true, features and needs which most American cities, in the north, have in common; and Mr. Hynes' plea for a civic centre in the neighborhood of the City Hall is justified on the ground of the stability it gives to property and the encouragement it holds out to development there in a permanent way. This centre, as far as locality is concerned, is almost established now in Toronto, and will be finally assured when the radial avenues are run, which have been already called for by the extension of the city to N. E. & N. W. But the tendency of public buildings in Toronto is upward, in the brighter part of the city; where is already a park that any city might be proud of. This and her other individualisms should be the basis of improvements for Toronto's plan. This is concrete application. The study of the plans of other cities is only general culture in the art.

We have a communication from [illegible], a firm of architects who wish to ventilate a complaint as to the number of letters they receive from manufacturers and their agents, asking whether their goods are specified on [illegible] whether anything in their line is specified, &c., &c. Part of the complaint is that there is no self addressed envelope and no stamp, and the letters must be consigned to the waste-paper basket.

If our correspondent were to comment upon his own letter, he could hardly fail to see that this latter point is the key to the situation. These correspondents do not expect an answer. It is enough for their purpose if

they have, by means of a letter imitating typewriting, succeeded in bringing these reminders of their goods, before his eye, on their way to the waste-paper basket. How far the method is wise it is hard for an ordinary man to say. It is at any rate wasteful. Nature, it is true, is the same. Many seeds are dispersed for one that takes root. But the extra output of nature has value as food, while the product of the waste-paper basket is food only for the furnace, and bad for that. In so far as the waste of an architect's time is involved, these advertisements, that gain attention under the guise of correspondence, are not only wasteful but are injurious to their own interests; for the first property of advertising matter is to be attractive, but these are repellant.

A Builders' Organization.

Some years ago a series of articles was published in this Journal advocating the formation of a Builders' Association for the Province of Ontario. Apparently the time was not ripe for such a movement and no action resulted. Recently, however, the Builders' Exchanges at London and Brantford have taken up this question, and are endeavoring to secure the formation of such an organization. At the Annual Banquet of the Toronto Builders' Exchange last month, the representatives from the London and Brantford Exchanges brought this subject prominently to the front, and on the following day the matter was further considered at an informal meeting of the Toronto Exchange. The opinion of the Builders' Exchanges throughout the the Province will be invited, and they will be asked to offer suggestions as to the basis on which a Provincial organization should be formed. The opinion prevails among members of the Toronto, London and Brantford Exchanges that if an organization can be properly constituted, work of much value to the building interests might be accomplished. This opinion is in a measure based on the good results which have already been attained by the local organizations. There are certain questions of a broad nature which these local organizations are not competent to deal with, and which it is felt might be effectively dealt with by a central association. Among these might be mentioned legislation affecting the interests of builders, insurance, the question of apprenticeship, a uniform agreement between employers and employees, etc.

The builders feel that they are surrounded on all sides by organizations with which they have intimate business relations, and it is time that they also should band themselves together for the consideration and furtherance of their interests. The Canadian Architect and Builder will be pleased to publish the views of any reader on this question.

Concrete Blocks.

There is no doubt that the cement block has a future. It has as a matter of fact a present. But the present is not altogether satisfactory, and there are difficulties about making it so. Yet it is in the improvement of the present that the chance for the future lies. There are two points in question, strength and appearance. As to the first, it is difficult to establish any guarantee but that of the character of the manufacturing firm; and it is of the first interest for every manufacturer to establish a character for strength and durability in his blocks, and to see that nothing happens to give occasion for doubt in that respect. It is easy to spoil a block or a set of blocks, and there is money to be made (for a time) in making them carelessly. The wet process is the best for the block; but requires a large number of moulds, if there is to be rapid production. The moist process is therefore introduced, in order to save moulds. There is no objection to this, apparently, if the blocks, when taken from the mould, are put in water, or damp sand or sawdust, to harden. In other words moulds may be saved but not labour. The tendency will naturally be to go as far as possible towards saving both. This process, as well as the materials used and the manner of mixing, will require, for constantly good results, not only liberality of mind but constant and careful supervision.

Defects of this kind, however, though hard to perceive in the block, are not really difficult to prevent, if there is the will to do it. It is the question of appearance which is of the first importance; for it occupies the perception, to the exclusion of everything else, and is difficult to make satisfactory. If negative criticism will do any good, it is not hard to see that the failure lies in monotony. Both the colour and the unvarying size and shape of the blocks would be a hard matter to overcome in any case, but the makers add to these disadvantages by trying to give the blocks a face like natural stone. The accidental spalling of a rock face is selected—a surface which the most experienced stone cutter could not strike twice, exactly alike, in a hundred trials—and this is repeated, all round the house, in even courses, all the way up, until whatever life is possible to the material is lost in expressionless monotony.

Far preferable to this would be an abandonment of all effort to give appearance to the block. Let it have just true edges and a plain face. It is conceivable that there might be two heights of courses, running alternately. It facilitates work to have a sill course; and this may be repeated where there are no sills. At any rate a sill course and a head course, different from the walling, would be a relief. And moulding (discretely) is suggested by the nature of the material.

The question of colour appears to be difficult but not impossible. Chemical admixtures are not good for compositions of cement, and some otherwise effective substances would be dangerous to use on this account. But there appears to be a mistaken idea—if one may judge from expressions in Mr. Sherer's paper, reprinted in this issue—that much colouring is necessary. "A strong, deep, cherry red," "moss or olive green with streaks of a livelier colour running through"—this is immoderate language to use about architectonic material. Architectural colours are slight. In stones (and concrete classes with stone) the colour, properly so called, is so slight as to be hard to name. Building stones have tone rather than colour. There are dark stones and light stones, each inclining but slightly to some colour. The best tones for building are light tones; and cement has a light tone. Cement is unfortunately harsh in tone, but it ought not to take much colour to overcome this; making it much as it was, but mellow. Slight variations in the blocks would be gain, if they were the result not of effort but of intelligent indifference. But who shall persuade the conscientious foreman that this is good work!

MARSH'S REINFORCED CONCRETE.*

The use of reinforced concrete at present has the disadvantage of want of exact knowledge. Those who use it become tied to some system and limited by its methods. This is not a state of affairs that can long remain. The whole world is at work finding out the possibilities of the new material; and a first hand knowledge of the principles involved in its construction is necessary for designers who wish to be up to the mark and happy in their work in following the progress of the times, no less than to the few original thinkers to whom a little knowledge is of no use, who must appropriate thoroughly before they can use at all.

For this reason the publication of Marsh's Reinforced Concrete is an event, since it gives a comprehensive account of what is known about the material and what has been done with it, up to the present time, and points out how to apply this knowledge.

The work is divided into seven parts of which five, concerned with facts and abundantly illustrated, are comparatively easy reading; the other two, devoted to theory, will require study.

Part I gives a general review of the subject, with a summary of the advantages and disadvantages of the material. The Advantages make a strong array. They are Fire-resisting qualities; Durability; Impermeability, which does away with cost of maintenance and also makes it a defence against vermin, borers, insects and even, it is said, microbes; Monolithic character, which makes structures composed of it resist vibration, shocks, unequal settlement etc.; Evenness of Temperature and Deadening of Sound in buildings; Ease and Rapidity of Erection; Notice of the Approach of Failure; Economy; and Appearance. The latter advantage, though the claim is justified by some of the structures shown in the illustrations of this volume—noticeably by the bridges, which, from the slight curva- of the arch, made possible by the material, are very graceful—can hardly be said to be established with certainty yet, or upon very sure lines; but in this unsolved future lies a stimulating interest in the material. It seems inevitable that a material compounded of plastic and flexible elements, which can each be brought into the exact position to meet the stresses to which they are subjected, will ultimately take form according to the lines of stress; for this reason departing in some way from the appearance of timber and masonry construction, in which, right lines being the condition of strength and stability, the lines of stress are taken care of by increasing the bulk of the member rather than by adapting its form.

The Disadvantages of reinforced concrete are two: First, the Precautions necessary in selecting and preparing the material, and in making economical but true and immovable falsework; and, secondly, Doubts as to Proper Method of Calculation.

The [illegible] upon the proportion of the materials in combination is still going on, and we may expect more knowledge and better formulae; but the formulae at present in use are based on data deduced and hypotheses assumed from present knowledge, which is true as far as it goes; and there is nothing to prevent us from going ahead with these, and appropriating further enlightenment as it comes. Mr. Marsh's corrective for doubt in the matter is the fact that reinforced concrete construction is mainly in the hands of patentees of the different systems and that they "do not rely so much on their patent systems for bringing them business as upon the fact that they thoroughly understand the work and have in their employ men who have become thoroughly accustomed to use the care and forethought that is undoubtedly requisite." But that is England. We are not in such a happy position here. If the patentees have a local agent in the large cities, that is the most we can expect. It is on the whole safer to seek security in knowledge; in becoming ones self thoroughly accustomed to consideration of the care and forethought which are requisite.

Part II is long and interesting. Its nature will be understood if it is briefly stated that it is an account of the different "systems" employed. There are 44 of them; chiefly French and German or Austrian; but England, Holland, Switzerland and Italy are represented, and there are 8 in the United States. There is a full account of each with plentiful illustrations.

Part III treats of materials. A great point in favor of reinforced concrete is that the materials are used to the best advantage and therefore can be reduced to a minimum; but there is involved in this a necessity that the materials should be good. As there is a saving in quantity we can afford to pay more attention to quality; but attention is required and constant attention too. As it is important that the concrete should be of the same strength throughout, the materials used in making it must be of uniform quality. The matrix, which must always be cement, must also, Mr. Marsh says, be Portland cement and artificial; no other cement and no natural cement being strong enough or sufficiently certain in its behaviour. The specifications for cement and the methods of testing its essential qualities of Coolness, Fineness of Grinding, Specific Gravity, Constancy of Volume, Time of Setting, Chemical Composition, and Cohesive and Adhesive Strength, are considered in a series of sections in this part.

The aggregate receives attention chiefly in point of size and cleanness. The latter implies chemical cleanness as well as freedom from argillaceous or organic matter. Sand or gravel that has been in contact with acid or alkaline solutions, or the presence of sulphur in slag, are a danger, to both concrete and reinforcement, which requires probably more care in country work than in work in the cities. An instance is given of the loss of a large quantity of concrete, in consequence of the water, with which it was mixed, having been taken from a mountain stream into which some chemical refuse had been turned at some distance above the spot from which the water was taken. In the city the water is at least chemically pure and can be trusted to be always the same; and the aggregate comes usually from recognized sources that have been tested before and are not exposed to this kind of danger.

The size of the materials of the aggregate, their proportions and the methods of mixing, occupy the rest of this part, with a table of quantities as used by different authorities for different species of works. There is also a short section upon the reinforcing metal. The choice between wrought iron and mild steel is in favour of the latter except when welding is necessary, when wrought iron is safer than steel.

* Reinforced Concrete by Charles F. Marsh; published by Archibald Constable and Co., 16 James St., Haymarket, London. Price 31s. 6d.

The tests given for application to each material suggest that steel may sometimes be more economical to use, because of its greater strength.

Part IV treats of Practical Construction :—the moulds, falsework, reinforcements, the advantages of moulding in place and in advance, and the method of constructing the different parts of a building and other structures to which the material can be applied. This part is copiously illustrated.

Parts V and VI are the theoretical backbone of the book. Part V, called Experimental Research and Deduced Data, gives an account, with diagrams, of experimental tests made of reinforced concrete structures and members. From observation of these experiments are deduced data for Part VI, on Calculations. This part after a preliminary section to establish the Necessary Hypotheses ; and a section devoted to the theory of Loads, Bending Moments, Shearing Forces, etc., as applicable to reinforced concrete ; goes at length into the question of Formulae, and the demonstration and establishment of Formulae for different stresses and reinforcements in different structural forms. A Proposed Method of Reinforcement and Calculation, which constitutes one section—a suggestion to reinforce pieces by hooping, to prevent the swelling of the concrete under compressive stresses, combining with it reinforcement on the tensile side to induce compressive stresses in the concrete—is one of the hints that changes in form may come ; for the most effective form for hooped reinforcement is not rectangular but round.

Part VII gives an account and illustrations of structures that have been erected in reinforced concrete. These are piles, warehouses, chimney stacks, lighthouses, churches, houses, shops, factories, covered reservoirs both sunk and elevated, silos, markets, theatres, railroad signal cabins and water tanks, stand pipes, aqueducts, water pipes, sewers, cement bins, bridges in great variety, quays, balustrades, sidewalks, vault light slabs, canal and river bank protections, railroad sleepers, troughing for electric cables, retaining walls, and a jetty on posts. We speak of these headings as plural, without knowing whether some cases are not solitary ; but the impression left be the chapter is of a vetriable age of concrete.

BOOKS.

A History of Architecture by Professor Bannister Fletcher and Bannister F. Fletcher. Published by B. T. Batsford. Agent for Canada, Thomas Henry, 53 McGill St., Toronto. Price $6.30, post paid.

This is the fifth edition of this History and it is visibly [illegible] book has been re-written and that 700 new illustrations have been added.

The intention of the book is to apply scientific method [illegible] style is treated in the same way. First the influences that brought the style into being are considered ; influences Geographical, Geological and Climatic which affect the structure ; influences Religious, Social and Political, which affect the character and condition of the builders ; and Historical influences which affect the course of affairs from without. Then the character of the architecture, so produced, is described ; that is to say its special quality is noted, and the general effect produced by the buildings as a whole. Next, examples are given of particular typical buildings ; and, finally, a comparative analysis, in which every style of architecture is regarded as the solution of certain fundamental problems viz.: Plan, Walls, Openings, Roofs, Columns, Mouldings and Ornament. Each building must have all or most of these parts and it is instructive to compare the solutions, by the different styles, of the problems these parts involve. In fact this is the true way to study the history of Architecture. The more extended the knowledge of how these problems have been solved in the past, the more just is likely to be the perception of how they should be solved in the present. It is by the study of all styles alike that the student acquires openness of mind to admit new ideas, and flexibility of mind to seize the point of view of other men ; acquires, in one work, culture. The secret process of such study is however a continual process of comparison, instinctive and often unperceived, and therefore, to the unaided student, slow and sometimes insufficient to attain the result. The business of the Architectural Schools is to direct attention in this way. For this reason the History under review is a good text book for the Architectural Schools and for the examinations of the Associations ; but more especially for the solitary student, who thus gets the advantage of tuition. The process of practical familiarity with any one style is a different process and less educative. It is a purely technical training which should come after and indeed must come after, or rather must have the general training come first, in order that there may be first a sure perception of the nature of design, without which the study of any one style is sure to degenerate into crude, unpractical and inartistic copyism.

It should be added, in order to give a full account of this book, that the chapter on each style concludes with a list of the books which treat of the style.

A Hand Book for Superintendents of Construction, Architects, Builders, and Building Inspectors; by H. G. Richey, Superintendent of Construction U. S. Public Buildings. Published by John Wiley & Sons, New York. $4.00.

This is a book of 742 pages, but printed on thin paper, bound in flexible Morocco, and convenient in shape for carrying in the pocket. It is a comprehensive work, intended both for study in the office and reference on the works. It has therefore a double character combining the sort of information usually met in text books with the sort usually found in handbooks. The operations of piling and foundations, stone and brick work, carpentry, plastering plumbing, &c., are described at length, with illustrations. To these are added a section on concrete reinforced [illegible] terra cotta fire-proof and slow burning construction which is concerned to a great extent with the products and systems of patentees. Wiring, heating, paper-[illegible]

In fact it is in body a treatise on building operations. But combined with each part are the tables, formulae and other information necessary to carry out the building operations which it describes. There is also a part concerned with drawing and laying out work, and combined with it, the various tables of mensuration and the problems in geometrical mensuration required for such work.

In the main a compilation, there is evidently new matter in the book as well as new arrangement.

OUR ILLUSTRATIONS.

COTTAGES.

As a contribution to the housing question we present a couple of pages of illustrations of labourers' cottages. In both the American and English examples the cottages are intended for agricultural labourers. But our housing of this sort is for the most part suburban in character ; detached or semi-detached ; and hints may be taken from these designs. The American example is most like home—all in-doors and more provision for comfort. But in the question of design Mr. Maurice B. Adams is stimulating. His one storey cottage is poetry. The pair for reinforced concrete depend to an unfortunate extent upon the M roof for their appearance. That must give place to a longitudinal ridge; but the double gable is not impossible combined with this, even when contiguous ; and if, (with the sacrifice of a little room in the bedroom), the single projection is made into two, with gables subordinate to the main roof, the composition is improved rather than injured. The American example is most pleasing in plan. The

small view here presented shows that, in spite of its apparent simplicity, the design would be better if it were more truly simple. There is provision for a good sized family in each of these houses and the kitchen is certainly handsome ; but it is questionable whether Mr. Adams division of the same space into two rooms is not preferable. If we recollect rightly it was much this arrangement that caused so much trouble in Miss Wilkins' story; "The Revolt of Mother." Since the old farmer would not build the new house he had promised, his wife, the good mother, took possession of the stable he had built instead ; and her reason was that in the old house there was only one room to sit in, and how could their daughter keep company with any one if there was no room to receive him in? Home is the proper place for this proceeding and in this house, if the family holds its ground in the kitchen, there is no-[illegible] for the young couple to spend the long winter evenings but the woodshed. Either of the English one storey plans are better off in this respect, and, curiously enough, in the American manner ; for while the [illegible] retire to the scullery and work.

House on Manning Avenue, Toronto.—Messrs. Chadwick & Beckett, Architects.

This house occupies the north end of a 22 ft. wide corner lot, of which the south front is occupied by a shop. There were 49 feet available at the north of the lot for a house, with frontage on the side, or east, street, and light on the north line ; light also, of course, within the lot, looking south to the shop. The house fills the lot, being 22 ft. from E. to W. (dining room and drawing room each 10′ 0″ wide by 14′ 9″ long), and occupies 34 ft. of the lot southwards, leaving 15 ft. for a yard. This is a true city house, of a type which is rare in Toronto, but ought to be usual now. It will be noticed that there is no exterior wood finish except the front door protection. The rafter feet just clear the wall and the gutter is the only cornice.

House for Mr. G. H. Chambers, Winnipeg.—F. R. Evans, Architect.

The narrow lot is the great trouble in planning the city house. The double-sided house with three rooms down-stairs, and the kitchen making a fourth without projection, is the house that everybody wants. If blocks were planned oblong with less internal depth we might be able to afford the other 10 or 15 feet in width that is necessary. The land inside, that is never used to any real purpose, must be represented in the value of the frontage, and we should be better off with less of it. This Winnipeg house plans well and builds well. Everything falls in place without torturing; and, even in looking at the plan, one has a sense of spaciousness.

Front of St. Augustine's Church, Pittsburg.—Messrs. Rutan & Russell, Architects.

This photograph, from the Eighteen Club Exhibition in Toronto, last month, comprises enough of the gable to indicate the nature of the front and that it is carried out in a characteristic manner. Yet it does not seem so irreconcilably Italian as to be out of place in America, as the place of worship of a traditional church. The details are all old acquaintances but they appear to have been chosen with taste, so as not to shock us with a suggestion of the outré or exotic. The building is very much in our own manner ; and there is this to be said of Italian Romanesque—that its breadth of wall suits brick, which is our ordinary building material, better than Gothic as we are too apt to have it ; Gothic, that is to say, derived from stone and rejoicing in parts, rather than the modern English brick Gothic of broad surfaces of wall and window. It is perhaps not well to place too much confidence in a design of which one has not seen the whole, but the part before us is decidedly agreeable. The slight obtrusiveness in scale of the niche, both in general effect and in detail, seems to be no defect ; but rather a virtue, giving life to the composition.

Drawing by Mr. Wilson Eyre.

The colour of the original suggests, more than the reproduction, the advantage of brick, and particularly of a brick wall, in a plant room like this. It is the glass that it is difficult to be happy with in places of [illegible] and even if he is wants just such a place as this ; a place for himself rather than for plants ; where, with [illegible] tions of temperature, he can enjoy their beauty and freshness, with room to sit and stand and even to walk. There is evidently a stone basin, for filling watering-pots, at the end; which gives a central motive for the wall. The single jet fountain, falling in a basin in the floor, is always a lovely feature in a house ; making a musical tinkle that does not interfere with conversation and is company for solitary thought.

ARCHITECTURAL ACOUSTICS.*

By G. R. ANDERSON, M. A.
Lecturer in Physics at the School of Practical Science, Toronto.

UNDER the general heading of Architectural Acoustics we shall have several related problems to solve, and it may be well at the outset to consider what these are. There will be,

1. The best form to give to an auditorium in order that the audience in all parts of the room may hear easily and without any confusion of sound or discrete echo. Here it may be pointed out that sound being reflected and refracted similarly to light, there may be formed regions of interference and foci representing concentration of the sound waves which will materially interfere with good hearing, if such points lie within the zone of the audience.

2. The arrangement of the heating, lighting and ventilation in such a way as not to interfere with the hearing in any part of the room.

3. The deadening of walls to prevent sound penetrating beyond the audience chamber. In this connection would also be included the location of pipes, ventilating shafts, etc.

4. The control of the acoustics of any audience room so that

(I.) The sound shall be sufficiently loud to be heard easily in any part of the room.

(II.) That the components of a complex tone maintain their proper relative intensities.

(III.) That the separate syllables be heard distinct from each other.

(IV.) In the case of music that there may be sufficient sustenance of tone to prevent the music from appearing dead or oppressed.

Apropos of this last condition it may be pointed out that in a hall destined for public speaking the reverberation should be as nearly as possible eliminated and that the most desirable duration may be different for different forms of music, so that a knowledge of the purpose for which the auditorium is mainly intended is necessary.

Sound being a form of energy, when once started will continue until it is either absorbed or transmitted by the furniture and boundary walls of the room. Scarcely any one can have failed to notice how a sound is prolonged in an empty hall or church, and how much more quickly it dies away in the presence of an audience. This continuance of sound after the source has ceased will be called reverberation, and is a measure of the duration of what may appropriately be called residual sound.

This paper will deal with the question of obtaining such data as may enable the architect to secure any required reverberation depending on the purpose for which the building is intended. The solution of the problem will then be to determine the absorbing power of the various materials used in construction, and of the audience, and then to so apportion them as to reach the desired result.

To measure the absorbing power of any room it will be sufficient to measure what is inversely proportional to it, viz., the rate of decay of the residual sound. For this purpose we require a sound of constant intensity and a device to measure with accuracy the reverberation after the source has ceased to speak.

The apparatus here exhibited consists as you see of an organ pipe of pitch C-517, mounted on a wind chest and operated electrically. This is in series with a specially designed torsion chronograph, so that the drum on which the records are made is held in its initial position so long as the pipe is sounding, but is released the instant the pipe stops. A second electric key serves to operate a pencil which makes a record on the moving drum at the instant that the operator decides the sound has become inaudible. Then, knowing the period of the drum, we can readily determine the exact duration of audibility of the residual sound.

The method of solution will be best understood by the study of concrete examples.

If a room could be constructed whose walls were perfectly reflecting, the sound once started would continue indefinitely, and to measure the absorption of any material we would merely have to introduce a certain quantity of it and measure the duration of the residual sound, and so calculate the absorbing power directly. But such a room is not possible, and therefore we are driven to calculate the absorption of any material by a process of elimination.

We will consider the lecture room of the Fogg Museum at Cambridge, having a seating capacity of about 500, the volume being 2,740 cubic metres. In this room there were introduced by degrees a number of elastic felt cushions, the duration of the residual sound being measured from time to time, the results of which are indicated in the annexed table :

Area of Absorbent. Cushions.	Open Windows.	Duration of R. S.
0	0	5.61
5.2	4.2	5.33
11.	8.8	4.94
18.2	14.6	4.94
28.6	22.9	4.21
41.	32.8	3.94
54.	43.2	3.49
67.6	54.1	3.33
83.2	66.6	3.00
94.2	75.4	2.85
105.3	84.2	2.64
122.8	98.2	2.36
138.4	110.7	2.33
157.3	125.8	2.22

In order to render these results universally serviceable we must adopt some standard absorbent, and for this purpose an open window is at once the most easily available one and is practically absolute. A comparison of the absorption of the cusions with that of an equal area of open window gave as the coefficient of absorption of the cushions in question 8. If now we plot these results on a system of rectangular co-ordinates, we obtain this curve,

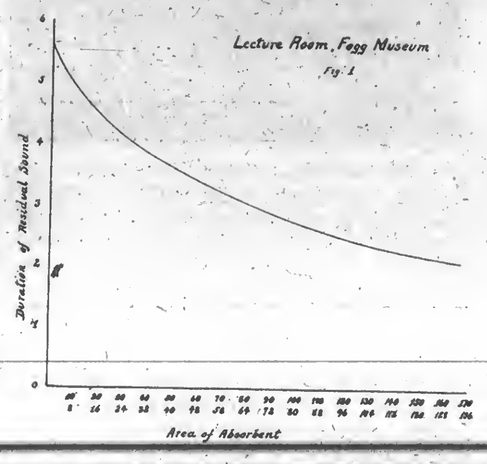


Fig. 1, which from the fact that it is evidently tangent to the horizontal axis suggests a rectangular hyperbola. To exhibit such a curve in full we shall have to shift the vertical axis to the left as shown in this second figure (Fig. 2) where the curve is symmetrical with regard to the [illegible] to the cushion or open windows while the dotted line is [illegible] for this curve is $(a+x)\ t = K$, a constant, a representing the fixed absorption of the walls, and x that of the added absorbents, either cushions or open windows.

[illegible] the [illegible] we have, a,

(·94 sq. metres of cushions
(·73 sq. " open windows

that is the total absorbing power of the walls, floor, ceiling and furniture of this room—75 sq. metres of open windows.

Having thus obtained the total absorbing power of a room, the next thing is to apportion that absorption among the various surfaces. For this purpose we shall require observations on as many rooms as there are different substances in order to secure enough independent equations to effect a complete solution. The following

tions :

1. The duration of audibility of residual sound is practically the same in all parts of an audience room.

2. The duration of audibility is independent of the position

3. The efficiency of an absorbent in reducing the duration of audibility, is ordinarily independent of its position.

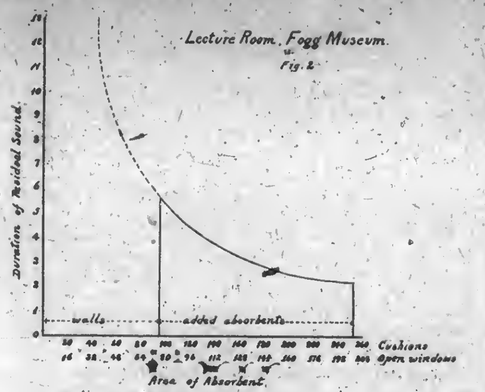
These propositions which are readily verified by experiment are *a priori* evident when we consider that in a room of even fairly large dimensions the time taken by the sound to distribute itself is very small, the velocity of transmission being about 1,100 feet per second.

*A paper read at the Annual Meeting of the Ontario Association of Architects by Mr. G. R. Anderson, Lecturer in Physics at the School of Practical Science, Toronto.

example of four small rooms will illustrate the method of solution :

Room	Area of Absorbents. Hard pine	Glass	Brick & Cem't.	Total Absorp'n
1	127.	7	0	8.37
2	84.8	6	30	5.14
3	12.7	80	85	4.64
4	2.1	0	124	3.08
Coeffts. of Absorp'n.	.058	.024	.023	

To find the value of the constant K we may substitute in the equation $(a+x)\ 1 = K$ any of the values already given, e. g. $(75+83.2)\ 3 = K$ which gives K=474 for this particular set of experiments.



In order to get at the physical significance of this constant K we will consider it in connection with a number of different sets of observations.

Room	Volume=V	Absorp's=a	K	$\frac{K}{V}$
1	99	8.08	15.4	.155
2	1480	34.5	243	.164
3	1960	101	345	.176
4	2740	75	474	.170
		mean =		.166

Here K is approximately equal to .166 V. That K should be proportional to the volume of the room may be inferred from the following considerations : the absorption of the walls, etc., (a_1) is proportional to their area, that is to the squares of the linear dimensions, and the duration of the residual sound (t_1) is inversely proportional to the number of reflections of the sound, that is, it is directly proportional to the linear dimensions, and consequently K, which is proportional to the product of (a_1) and (t_1), is obviously proportional to the cubes of the linear dimensions, i.e., to the volume.

It is evident that K will also depend on the initial intensity of the sound, but the consideration of this point may well be omitted from this already long paper ; and furthermore, so long as the intensity is constant, its absolute value is not material to our results. In all these experiments the initial intensity was approximately 1,000,000 times that of minimum audibility.

We will now give some data derived from these experiments :

Substance.	Coeff't. of Absorp'n.
Hard pine sheathing	.058
Glass	.024
Brick set in cement	.023
Plaster on wood lath	.034
[illegible]	[illegible]
Plaster on tile	.025
Ash settees, per seat	.607
Bent wood chairs	.606
Upholstered settees, per seat	.28
Upholstered chairs (hair & leather)	[illegible]
Hair cushions, per seat	.21
Elastic felt cushions	.20
Oil paintings (including frames)	.28
House plants (per cub. metre)	.11
Carpet rugs	.20
Oriental rugs (heavy)	.29
Cheese cloth	.02
Cretonne	.15
Shelia curtains	.23
Linoleum	.12
Audience, per person	.44
Isolated man	.48
Isolated woman	.54

To illustrate the practical application of the foregoing principles we will consider the result arrived at in the construction of the Boston Symphony Hall.

Absorbents	(Area in Sq. M.	(Coeff'ts of Ab.	(Tot. Ab.
Plaster on lath	1040	.034	35
Plaster on tile	1830	.025	46
Glass	22	.024	.5
Wood	625	.06	37.5
Audience	2570	.44	1135
Orchestra	80	.48	38
			1292

Volume = 18300 cub. metres.

$$Kj = 18300 \times .164$$
$$= 30012$$
$$t_1 = \frac{30012}{1292} = 2.32 \text{ seconds.}$$

The figure arrived at was decided upon from the consideration of two buildings, the old Boston Music Hall and the Leipzig Gewandhaus, the former having a seating capacity of 2,391, and a reverberation of 2.44 sec., and the latter a seating capacity of 1,517, anh a reverberation of 2.3 sec.

For the data used throughout this paper I am indebted to Professor Sabine, of Harvard University.

DISCUSSION.

Mr. Symons: Mr. President and Gentlemen,—In rising to propose a vote of thanks to the lecturer I should like to say that I think we are to be congratulated on having among us a gentleman who is able to bring before us so lucidly a subject of so much difficulty. I think I am safe in saying that this matter has never been brought before us at any previous meeting of our Convention and I suppose one of the reasons of that is that it is a difficult matter to treat, Certainly not because it is of little value. Professor Anderson in dealing with the subject from the standpoint of absorption of the walls has done us good service, inasmuch as that is a matter that we can more readily handle than the question of form. To construct a building having the proportions and form that have been found best for accoustics is a matter of difficulty. It is rarely that we can build in the shape best suited for that purpose, but we can all of us handle more or less readily the materials of which the walls are to be constructed. I was particularly struck with the Professor's opening remarks in which he spoke of the material covering these walls acting so effectively to absorb sound. I dare say we have all in our experience had illustrations of this fact more or less. Not very long ago I was dealing with the alteration of a room and immediately after the building was finished, while the walls were quite bare and the plastering just completed, I was dismayed at the effect of sound. The speaker had to occupy a position at the side of the room. The room was not very far from the proportions here and on the side opposite to the speaker the ceiling sloped down to about half the height of the room. The echo was dreadful. I wondered what would be the effect when people were in it. A few pictures were hung, and the chairs were brought in and other small articles of furniture, but more particularly the presence of the audience seemed to cure the difficulty. There has been very little trouble since the room has been occupied. The materials that were mentioned as having such good pro- [illegible] and as we have had placed before us so clearly the way in which this can be done, this paper is of definite practical value to us. That the position in which these materials can be placed does not materially affect the improvement is a point the knowledge of which may save us much misdirected effort. A building that has been looked upon as perhaps one of the most perfect auditoriums in the world is that of the Mormon Temple in Salt Lake City. I have seen outlines

of the form of that room which I think is of very great size; some 250 by 150 feet. It is I think almost a perfect oval. I don't know of course anything about the material of which the walls are formed but I presume they are of some material fairly absorbent. But, whatever may be the truth as to the best form of chamber, we may seldom have the opportunity of devoting our efforts entirely to its attainment. We have all, however, within our reach the means by which we can overcome imperfections, and for the knowledge of what these are and how to apply them we are very much indebted to Professor Anderson. I have much pleasure in moving a vote of thanks to Mr. Anderson for his valuable paper. (Applause.)

The President: Are there not forms of rooms in which it would be utterly impossible to reduce the echo sufficiently to make it a good speaking room?

Mr. Anderson: Of course there are some forms of rooms that are quite unsuitable for public speaking. There is no question but that a room that focuses the sound at some particular point is going to prove detrimental to the hearing. That room could not be made perfect but it could be very much improved. If we take the room and succeed in absorbing the sound we shall certainly reduce it. There are rooms that from their form would not be capable of being brought into a perfect condition, but we can always improve a room which has decidedly bad reverberation. Improvement is all that we can hope for in a room that has been already constructed and where principles have been obviously violated. But the question of form is a very important one; perhaps quite as important as the question of material. It is a question that I have entirely avoided in this paper. I had not time to consider both of them. All I can say now is that a room that is bad cannot be made entirely good, but it can be improved.

Mr. Pearson: The room used as an example is for orchestral music; the time there is 2.32 seconds. For speaking what should be the time?

Mr. Anderson: As low as possible. There is no object in having any decided reverberation for a speaker. That means that a room suitable for an orchestra is not suitable for a speaker. I might say in this connection that data have been determined for piano music, by making a number of tests in the new Conservatory of Music. The figure arrived at was 1.08 seconds. That was arrived at by tests conducted there with a similar apparatus to this. The judges were the President of the Conservatory and several members of the faculty. Nothing was said about the apparatus; they simply decided when it was right and when it was not. Curtains were draped around the room until a certain stage was reached. One of the faculty played a number of airs on the piano and they decided whether there was too much, or not sufficient, reverberation. The [illegible] figure of 1.08 was arrived at. That is only about half for orchestral music. For speaking the reverberation should be very slight. A hall that has a reverberation of more than one-half speaking.

Mr. Pearson: What would you consider the best form of room for speaking and for orchestral purposes?

Mr. Anderson: I do not think there is any form better than the rectangular for either purpose.

Mr. Burke: Mr. President,—In connection with the form of room I remember my late Principal, Mr. Langley, stating that it is practically impossible to make an octagonal room suitable for speaking. He had built a little chapel on Albert Street of octagonal form and it was never good for speaking in. I also remember a church in Montreal, built on the octagon plan, which was never satisfactory. They put in wires, curtains, and galleries and never could make it thoroughly satisfactory. I have always understood that the form of the Greek theatre is considered the best for speaking; that is a semi-circular building with a straight wall at the back, such as the hall that Professor Anderson spoke about. In my own experience I have found that a semi-circle or a little more than half the circle, with a flat wall at the back, is practically perfect for speaking purposes.

Mr. Anderson: Let me point out that such a building would be practically rectangular. As a rule it is only the seating that is semi-circular. I would not say that a rectangular building is perfect or that the other is perfect, but I think that the semi circular building with a wall at the back would be equally good.

Mr. Burke: The Jarvis street Baptist church is a little more than a semi-circle and you can almost hear a whisper when the speaker is on the platform. On the other hand it is not as good for choral music as it ought to be. Everything seems to come right at you; there is no reverberation.

Mr. Pearson: Taking the second column, plaster on lath, are those figures constant?

Mr. Anderson: Approximately. There would be small variations depending on the thickness of the plaster and its kind and so on. But those quantities are fairly constant. Hard oak would differ slightly from pine but not very greatly. Those differences are comparatively small and in any case it would simply lie with the architect to obtain such data as he could of various forms of material used and keep them for reference.

MISSION FURNITURE.

Art in house furnishings never fares so hard in this country as when it tries to assume the virtue of honesty and avoid the appearance of deceit. Everybody whose memory runs back a third of a century will recall the dreadful shamming which overwhelmed the "Eastlake" movement, and a glimpse at the catalogues of "mission" things now to be found at every turn—the catalogue—brings to mind the old horrors when sham wedgepins and tenon ends were glued on almost any place for decorative purposes. Eastlake things went the way of all the world, not so much because they were ugly, or because they came to be made by people without anything genuine in their natures—such people as wave the flag and make a loud noise on state occasions and call their efforts patriotism—but because change of fashion ruled them out. Now one might well respect the founders of the missions, who with crude tools and at plenty of cost of hard labor, made lumbering furniture that brought some degree of comfort to a simple, honest, hard life. If their chairs had legs two or three times too large, it is still easy to expect the maker for doing a thing that he probably regretted, at the time. The piece of musquite that he must use, could only be reduced to a proper size with his crude tools by an amount of labor which he could not spare from his other duties, so he cut it to his length and used it as it was, any notion of [illegible] being farthest from his thoughts. He then framed and joined the work as well as the limitations of his tools, his skill and time permitted, and while he rested, thanked God for what he had done and what had taught [illegible] fellow [illegible] honest pleasure in having a bit of furnishing that came from such sturdy hands, but when it comes to most of the latter-day stuff that is advertised as Spanish Mission furniture, stuff that is ground out by modern machinery and put together without intelligence, stuff in which structural skill is conspicuously absent, and silly profusion of material and sham constructive details most prominent, we submit that the degree of simplicity that with indifferent success it retains, ought not to save it. Yet, despite the fact that most of this stuff is lacking in all the qualities of quaintness and sturdiness that distingnished the originals, it will probably have its vogue until fashion decrees its undoing.—Western Architect.

THE COLORING OF CONCRETE.*

Having been requested to make a few remarks on the coloring of concrete, I will endeavor to give you my experience in that line. Representing the pioneer block manufacturing company of the Northwest, we have made many experiments in coloring artificial stone.

First, I will state to you that we found the ground colored natural stone and mineral iron oxide were the most desirable and practical, from the fact that they in no way weaken or damage the setting qualities of our stone, but, on the contrary, they add very materially to the strength of the finished product. We tested many different coloring compounds, some with fair results, but all those containing acids or greases (among these are graphites and lamp blacks) are found to be detrimental.

We tested some very fine samples of ground crushed stone from Europe and from different sections of the States, always with the same result. They are too weak in actual coloring matter to bring about the desired shades, and always with the same complaint, "too expensive." Expensive at least in the manner we always use coloring, as we color our entire stone.

Very early in our manufacturing experience, we dropped the facing plan and adopted the plan of coloring the entire stone. Beginners are led to believe, as we were, that the facing of stone is desirable. In theory it is all right; in practice we found it undesirable, and were not satisfied with the results financially. That many beautiful results may be obtained is true, both in the facing and coloring of stone, but that the facing of blocks is not practical, and that they are not merchantable, on account of the cost of manufacture, is also a fact, and we have found that the best results are obtained by keeping as close to the manufacture of your primary product as possible. We may at times find customers that will pay the additional price, but they are the exception and not the rule.

To illustrate this, we will mention that we were recently asked to figure on a very elaborate design for an office building for one of our large manufacturing concerns, but when we made our estimate and named the price, the owners simply shook their heads. That one of our competitors made this building is a fact, and that it is a handsome building is true. However, the contractor recently asked me to condole with him on the results financially. The only satisfaction I could give him, was the old reply, "I told you so."

In making tests either with coloring concrete blocks, or concrete of any character, it is our motive to make our product at a minimum cost, and market it at a fair profit in competition with other non-combustible materials.

The colored stone that we are most frequently called upon to imitate in Wisconsin is what is known as "Portage Entry Red stone." This is a Northern Michigan product, and we are at a loss to know why they term it "red" stone, for, in fact, it is a very light shade of pink, and the most singular condition is that if we were to produce an artificial stone as light in color, the public would exclaim at once, "Why, how pale it [illegible] is to place the natural product by the side of the manufactured, and allow our customers to see the difference. Then they say, "Why, I did not imagine it was so light."

[illegible] stone several shades darker (when first made) than the natural product. We are frequently asked, "Will not [illegible]" That the stone grows lighter as the cement sets is true, and it will continue to grow lighter until it has attained a thorough initial set and has become dry. This setting and drying process (as all of you know) is governed largely by the temperature and time of year, and the exposure to which the manufactured product is subject. All of you who are contractors and builders, know that when you desire a deeper or darker shade of mortar coloring, you are obliged to make your wet mixture many shades darker than when it is finished and the action of the lime has taken place.

We are also frequently asked what proportion of coloring matter we use per stone. This is rather hard to answer, from the fact that different block manufacturers make many different sizes of stone, and that the material used in different localities varies so much in character. We also find that different cements change the coloring more or less. However, this is not perceptible to any great degree.

In the manufacture of red stone with such sand and cement as we are in the habit of using, to obtain a strong, deep, cherry red after final setting, we find it necessary to use from 5 to 7 pounds of the pure mineral oxide per cubic foot of concrete. In this mixture we use clean silica sand containing no loam or clay of any character and very little organic matter. We also found that the thorough mixing of the color with the cement, before adding sand, was very necessary.

We discovered that to get good results it was absolutely imperative to have our sand thoroughly dry, and that we were obliged to mix sand, cement and color together thoroughly, much more so than in making the ordinary concrete block. We learned this early in our contracting career, when at times we found it necessary to use lamp black in producing dark mortar color. We were at a loss many times to find some liquid mixture with which the lamp black would thoroughly assimilate. At times we used vinegar, at others stale beer (and incidentally will say that this very seldom grows stale in Milwaukee). By simply taking very fine dry sand and mixing the lamp black with it thoroughly, we found no trouble in getting an even, dark color for our mortar.

We have been for some time endeavoring to get a green stone for an architect and customer, but as yet have not been satisfied with the results. We did make a green stone, the body of the block being of a moss or olive shade, with streaks of livelier green color running through, but we have been somewhat afraid to recommend this stone to the architect, as we have not fully satisfied ourselves as to the action of this ultra-green on the cement. Our first trial was some six months ago, and we are watching the product of this trial very carefully; as yet it shows no signs of disintegration, and we are now subjecting it to the strong climatic changes, to see what effect the weather will have upon it.

We also found that to get an even and artistic product, it is essential to have our materials as nearly in the same condition as possible, as regards moisture and mixing, all these little details causing additional expense over the original product we made.

We are frequently asked, "Have you experimented with hydrated lime, stucco or other fine materials, in making colored concrete?" Yes, we have experimented with all of these, and, in addition, have used other fine filling materials, such as Warrenite ground flint clay, also ground silica. I found that hydrated lime and gypsum quickened the setting qualities of the material, provided enough water was used and added [illegible] falling apart as the lime or stucco absorbs the moisture more readily than the cement, and robs it of the moisture it must have. I also found that if I succeeded in keeping it moist enough after a period of six months to a year, a composition almost as in to decomposition set in, and the mass would crumble and fall apart. However, the latter conditions did not occur with the ground Warrenite or fine silica, but we did find that it was necessary to add about 2 more parts cement to get desired results with the extremely fine material.

You ask, "Why use such fine material?" We found that in producing a beautiful colored artificial stone, it was necessary to have a very dense product, especially when your customer gives the stone a close and critical inspection. . .

* From a paper read at the Initial Convention of the National Cement Users Association, held at Indianapolis, by Mr. J. P. Sherer of Milwaukee.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

Q.—You refer in your last number to some drawings which were on tracing paper mounted. What would be a good class of paste for this class of work. I have not found the ready-made pastes very good, they allow the drawing paper to peel off?

Ans:—An excellent paste or cement for this purpose may be made as follows: Fine wheat starch, 4 drachms, beat into a paste with cold water; 1 oz. of Russian glue, dissolve in a pint of boiling water; and while boiling pour in the starch; put the whole in a saucepan, and boil until as thick as cream. When required for use, a small quantity may be melted in a little warm water. Another:—Disolve 2½ oz. Gum Arabic in two quarts hot water and thicken with fine wheat flour. To this add a solution of alum and sugar of lead: the mixture is heated and stirred till about to boil, when it is allowed to cool, it is then ready to use. Another:—Make a paste with fine nice flour, the same as in making an ordinary paste. Strain the mixture through cheese cloth. This makes an excellent paste, and is white and clean.

From "Contractor": Will you kindly advise me as to staining, filling and polishing a white pine floor of a dancing hall. There are a large number of knots in the floor, but most of them have been "chipped" and planed, yet some of them look rough and unfinished.

Ans.—The finishing of white pine floors entails much more labor and material to gain a good result than is the case with hardwood floors: the white woods, being much softer, absorb more material, and it is necessary to go over the work many more times before even a fair result can be obtained. It may be pointed out that stained floors subject to much traffic do not wear well, and consequently soon become patchy in appearance if they are stained a dark color; hence the advisability of keeping them free from stains likely to lie on the surface, instead of striking in and amalgamating with the wood fibres. As regards filling for the rough places, nearly all kinds of paste fillings on floors subject to vibrations caused by dancing are apt eventually to jar out, especially when used for filling up between the boards. Cracks should be filled in by inserting wedge-shaped slips of wood, and securing them with glue. Nail holes and rugged places surrounding knots may be levelled up with putty, provided the floor has been [illegible] on the bare boards. To remove the common appearance of white woods, it is the practice to brush them over with size, sufficient yellow ochre being added to [illegible] the nail holes, etc., and then lay on a coating of French polish or thin spirit varnish. This acts as a stiffener to set the putty, helps to keep out the dirt, and prevents the color used in the size from working up during the polishing process. Beeswax and turpentine is an old-fashioned preparation for polishing floors; but there are many special preparations on the market for the purpose as well as special brushes, which simplify matters very much. The beeswax and turpentine, or other preparation having been applied to the boards by means of a large paint brush or a piece of flannel, the work should be left for a time to allow the turps to evaporate. It is then polished with a piece of old blanket or flannel or pads of felt. Recipes for suitable polishes and stains, along with clear instructions for using same, are given in a book recently published, entitled "Complete Up-to-Date Hardwood Finisher" which may be obtained through this office. Price, post-paid $1.00.

From "The Country";—Where I live, there are no painters or paper-hangers, and I cannot go to the expense of sending to the nearest town—18 miles away—for a paper hanger, so ask you to give me some idea of how I can do the work myself. I have a fair knowledge of the method but do not know how to prepare the walls, which are perfectly dry, the house having been occupied now more than a year since it was built. Any information will be appreciated.

Ans.:—Before papering, walls should be washed and clairecolled. Clairecolle is a solution of thin size and whiting, and it is well where a house is tenanted during papering to deodorise the size and arrest its decomposition by the addition of carbolic acid; essence of peppermint, or cloves, as otherwise the smell is highly offensive to the inmates. Paper is of two kinds, English and American, a piece of the former containing 12 yards by 18 inches. Pink, green or blue papers should never be hung on new walls, the action of the lime destroying the color; the best papers will be found in those with old gold or terra-cotta coloring, patternless if possible.

The choice of papers is an inexhaustible matter, and only a few notes can here be given. Never select from a pattern book, but insist on a large spread of the paper, so that its effect on an extensive surface may be judged. For rooms with a north or partly north aspect select warm colors, for south aspect cold. Green papers, unless guaranteed non-arsenical, must be viewed with suspicion, although those from the best firms are almost invariably reliable.

The surface of so-called washable papers is very seldom durable, and it is the better plan to hang ordinary paper and size and varnish it afterwards. For bathrooms, kitchens, sculleries, and the like a varnished surface is imperative.

"Lincleca" is an excellent material for domestic offices, being an embossed and enamelled thin and flexible sheet zinc, easily cut or bent. It is fixed with a "paste" compound of white lead, whiting, and varnish, and is practically indestructible. Hang the paper in the ordinary way, seeing that the patterns match properly. The paste should be made with good wheat flour and should not be too stiff. Trim the edge of the paper before hanging.

From "A Builder's Wife":—Will you kindly inform me as to what is meant by a "Rainy day closet?" I have seen this referred to on several occasions, and would like to know what it means.

Ans.:—According to "The Scientific American" a rainy day closet is a device intended for the alleviation of the care of mothers. In it are placed toys to be mended, games from which the interest has temporarily departed, pictures to be cut out and pasted in scrap books, specimens of rocks to be classified, a book of conundrums, one on familiar science from which easy experiments could be taken for trial, a charade book, story books (new and old for all ages), crepe paper for making flowers, sheets of old calendars, from whose first thirteen figures the game of Numeral Patience could be made, pictures of persons and places mounted on cardboard, and intended speeially for the convalescent ward in the children's hospital; sewing, knitting, and crocheting materials; stamps to be pasted, materials for kite-making—in a word anything. A list of the articles and shelf where each is to be found should be placed on the inside of the door, and a custodian, generally the oldest daughter, appointed, who sees to it that the article chosen is delivered to the child choosing it. The door should be kept locked at all other times. No one allowed to ask for anything different under an hour, althaugh articlcs might be amicably interchanged.

From "Troubled":—I am desirous of having a steam heating plant installed in my house, and have had a plan prepared by an expert for the purpose, but, the plumber who is to do the work says he cannot get good service by placing the radiators as shown on the plan. To make such changes as he suggests, will add considerably to the cost, as more pipes will be required. Will a ventilation system make any difference in the working of the system?

Ans.:—We think it would be better for you to adhere to the "expert's" plan as he is supposed to know more about the matter than your plumber, as it is his business and his duty to know. However, as to the placing of the radiators:—When a hot air furnace is used, it has been found after much experience, that the best results are secured by introducing the hot air into the various rooms at a point as near to the centre of the house as possible, then draw it toward the outer walls by means of vent pipes. When the house is to be heated by hot water or steam by means of radiators, however, we have a different proposition and the radiators should be placed as near the outer corners of the house as possible. The vent pipes will be just as serviceable, for the hot air will rise from the radiators and after it cools drop to the floor and be drawn by the vent pipes. A suggestion for hot water or steam is what is known as an "indirect" radiator, a good adjunct to direct heating, and best placed in the hall or as near the centre of the house as possible. It is, as you probably know, nothing but a coil of pipes under the floor, with a duct to bring fresh air to the underside of them. The air, being heated in transit, enters the room as warm [illegible] vent pipes gives a constant though imperceptible change of air in most of the rooms. The doors need not always be kept shut in a small, private house, and [illegible] rooms. We make this suggestion, thinking it will solve the problem for you in a satisfactory and practical manner.

From "Contractor":—Is a vestibule necessary in a small house having a hall only seven feet wide?

Ans.:—A vestibule in a small house is probably just as important as in a large one, in a country, like ours, where severe winters and high northerly winds prevail. They may range in sixe from 7x10 feet to 10x10 feet. The idea is simply as a protection against the cold. They are not used in all houses and add a slight proportion of expense to any house. The extra cost is soon repaid in comfort and a more economic use of fuel.

From "Plasterer":—Is there a good book on plastering to be had? Please give me some information regarding "Plaster of Paris."

Ans.:—There are several books on plastering, Millers, being the best, price, $7.00; Hodgson's, price $1.00; Camerons Plasterer's Manual, price $1.00. We can furnish any of them. With regard to Plaster of Paris, this is obtained by grinding gypsum (a soft stone of crystalline texture consisting of hydrated sulphate of lime), and then calcining it in iron vessels until nearly all the water of combination is driven off. It is then in the form of a fine powder like wheat flour in appearance, but heavier. It is used alone or as an addition to other materials. When mixed with water, its sets very rapidly, and attains its full strength in a hour or two. It is made into a paste and and forced into gutta percha moulds. It expands in setting. It is used chiefly for cheap statuary and for internal decoration, cornices, contrepieces and other ceiling ornaments, console brackets, etc. It is also used for filling up holes or other defects in walls and ceilings and in pattern-making for foundry purposes. When mixed with lime for plastering, in the proportion of 1 to 4 or 5, it forms "gauged stuff" and causes the coat to set quicker and harder; but it cannot be used for external work, owing to its rapid destruction when exposed to the weather. There are three qualities of Plaster of Paris in the market—"superfine" and "fine," sold in barrels of 2 cwt.; and "coarse," sold in sacks or bags from 7 lb. upwards. Weight per strike bushel equals 64 lb., weight per cubic foot equals 50 lb. The gypsum occurs in many places in this and other countries, and particularly near Paris, in transpareat white crystals 4 in. or 5 in. long, 2 in. or 3 in. broad, and 1 in. to 2 in. thick, in irregular masses which break up into cubical pieces. When the gypsum is a translucent, or nearly opaque white, it is known as alabaster, and is used chiefly for statuettes and ornaments. When colored in mixed yellow and brownish shades, it is familiar as spar, used also for vases and ornaments. Plaster of Paris forms the basis of Keene's cement, which is Plaster of Paris and alum; Parian cement, which is Plaster of Paris and borax; Scagliola and Marezzo marble. It is the essential element in selenitic mortar, or Scott's cement, where the addition of 5 or 6 per cent. of Plaster of Paris to feebly hydraulic lime checks the slaking and expedites the setting, permitting also a larger quantity of sand to be used without weakening the mortar.

Bronzing Iron.—It is often wanted to bronze iron. The following is a good recipe. To a pint o methylated spirit add 4 oz. [illegible] warm place, and now and then shake it well. When the whole is nicely fluid, let it settle for at least 48 hours in a cool place. Pour off what is clear into another bottle and keep for the finest work. What is left in the first bottle, with enough spirits to make it work, does for the first coat after straining through a fine cloth. Now take ½ lb. of finely ground bronze green, enough varnish, and add the colouring matter. Warm the iron a little and lay on a thin coat with a soft brush. Repeat if requisite. Varnish over all. The shade can be varied by employing lamp-black, red ochre, &c.

FORFEITURE CLAUSES IN BUILDING CONTRACTS.

In building contracts there is usually a forfeiture clause—that is to say, an agreement that the builder shall in certain events, either with or without notice from the building owners, forfeit certain rights and property. The clause may be so framed as either to render the contract void upon forfeiture, or only to render the forfeiture a method of procedure for ensuring or completing the performance of the contract. The rights and property which it is generally sought to take from the contractor on entry and seizure or to rest in the employer are: the right to take possession of the work already done or to seize the materials, or both; the right to complete the contract or to employ or contract with some other person to complete the contract; the right to use the materials and plant to complete the work; the right after user to sell the surplus materials to recoup loss; the right to payment from the contractor for any loss sustained in completing; the property in materials on the site not built into the work; the property in the plant, scaffolding, and machinery; the property in the money retained by the employer but due to the contractor for work already done at the time of seizure. The forfeiture clause would not give the building owner all the above rights and property. The extent of his right will depend on the construction of this particular clause.

A building contract based on the theory that the employer is to be put in possession of completed works, and providing that all plants and materials brought on the ground by the contractor shall be considered the property of the employer until the completion of the contract has been duly certified, and that on default of the contractor the employer may enter upon and take possession of the works, materials and plant, and the expenses incurred in completing the works shall be a debt due from the contractor, vest the plant and materials in the employer at law subject to a condition that upon the due completion of the contract the contractor shall be at liberty to remove them. Therefore, if the contractor makes default in performing his part of the contract, and the works are in consequence never completed, neither he nor his trustee in bankruptcy can recover the plant or materials from the employer. The effect of such a contract is to provide not only machinery to enable the employer to secure the performance of the contract, but also a security for the employer that the work shall be performed, of which security the employer is entitled to avail himself if, by the default of the contractor, the work is not performed at all (Hart *v* Porthgain Harbor (1903), 1 Ch., 690).

It is open to the parties to the contract to make any event they choose give rise to this right of forfeiture, and, if so, it will be enforced by the courts, except in cases where the contract in that respect may be void on bankruptcy. The events (other than bankruptcy) upon the happening of some or other of which it is generally agreed in building contracts forfeiture shall arise are various. For example: Not proceeding as rapidly and satisfactorily as required by the employers or their agents; not proceeding to the satisfaction of the surveyor; not, in the opinion and according to the determination of the architect, exercising due diligence and making such due progress as will enable the works stipulated; being prevented from continuing the contract from any cause independant of the act of the employer; not completing by the time agreed; not proceeding in the manner required by the engineer; not doing the work according to specifications, stipulations, conditions, and drawings; failing to rectify work executed in an improper or unworkmanlike manner, after being served with seven days' notice to do so.

Where there is a clause providing for the avoidance of the contract, and the forfeiture of the contractor's implements and materials if he fail to proceed with the work at the rate of progress required in order to complete the works within the period limited for the purpose, or upon certain other events, such a clause can only be acted upon and enforced before the time originally fixed for the completion of the works has expired. And the exercise of the right of election to rescind a building contract on the ground of delay, or that the works cannot be completed within the given time, must be signified in an unqualified manner, and, at all events, not after the builder has gone to expense in the reasonable belief, induced by the acts or omissions of the employer, that the right of election would not be exercised, or has altered his position under such circumstances to his prejudice. The question when or at what time the right to avoid the contract is lost is open to some doubt.

When it is intended to take advantage of any breach of covenant or condition in a building lease or contract so that it should operate as a forfeiture, the landowner or employer must take care not to do anything which may be deemed to be an acknowledgement of the continuance of the contract, and so operate as a waiver of the forfeiture. Where there is a clause in a building agreement, that in case of default in not completing the buildings, at successive periods, the owner should be at liberty to re-enter and seize the materials, and successive defaults are made, and several periods of indulgence granted, but there has been no waiver of the last default on the part of the owner, and no alteration of the builders position to his prejudice, the owner may be entitled to re-enter and seize the materials.

If there is a mere license to seize, and no interest in the building materials, the license cannot be exercised to the prejudice of any person who has obtained an interest in the materials in the interval before seizure. It is important, therefore, for the protection of the employer that the building contract should contain a clause to the effect that all building materials brought upon the ground shall immediately become his property. A simple stipulation providing that if a builder becomes bankrupt certain plant and materials, which were his property up to date of the bankruptcy, should be forfeited to the employer, and be taken away from his creditors, is void, as being a violation of the policy of the bankrupt law. But power to seize the materials, in case the builders make default in or delay with the completion of the works, may be exercised on such default or delay occuring, although the builders have become bankrupt. A contract provided that the plant brought on the works "should be deemed the property of" the employers "for the time being," and should "not be removed during the progress of the work without the written order of the engineer," and that in case of the suspension of the works by the engineer for any act or default of the contractor, the plant should be "subject to be used" in and about the completion of the works. The works were suspended, the contractor went into liquidation, and the works having been completed by the employers, the plant was by consent sold. But it was held that the plant did not become the property of the employers, and that the user of the materials by them after the suspension of the works was not such a "dealing" within the meaning of the Bankruptcy Act, as to entitle them to set off the value of the plant against the sum due to them from the contractor for breach of the contract. If the materials are already, previous to the bankruptcy, either the property of the building owner, or if he has an interest by way of lien against the trustee, except in so far as the reputed ownership clause interferes.—Contract Journal.

To anchor a pipe cutting and threading machine to the cement floor of a basement is sometimes a puzzling problem. It may be solved by drilling holes in the cement large enough to receive the heads of a good sized bolt, molten sulphur being then poured in and allowed to set, when the bolts will be found to be as fast as the rock of Gibralter. The machine may then be set over the projecting bolts and the nuts screwed home. Sulphur is said to be superior to either cement or lead for this purpose.

MONTREAL NOTES.

THE APPROACHING BUILDING SEASON.

A great many building schemes are announced as in contemplation for the coming season. Whether Montreal is going to get what she most wants is open to question, but at this season of the year there is no doubt what is most urgently needed. The talk is all of the high rents which rise higher and ever higher. One can hardly cast a glance on a daily paper without lighting on some reference to the subject. There are probably few cities of the same size in which are so few houses which look like homes, while whole streets of recently erected dwellings for people of moderate means, proclaim unmistakeably, from every galvanized battlement and turret, that the first object of their existence is to extract coin from their tenants under false pretences. No doubt the demand is being met to some extent; it is difficult to judge how far, as the largest supply comes from the multitude of small individual speculations.

Amongst other bitter cries on the subject, one has taken the form of a petition from the Trades and Labor Council to endeavour to induce the Quebec Legislature to pass a law compelling the rents charged for houses to be based on the assessed value of property—a proposition which might take its place admirably in a scheme of things nearer to ideal justice than is likely to be found in the Province of Quebec for some time yet. Meanwhile there can be no manner of doubt, that the high rate of rents is having a most pernicious effect on the planning of the humbler sort of dwelling. Knowing well that people must be housed, and that in existing conditions, they may be compelled to pay whatever may be asked for whatever accommodation is offered them, speculators are putting up the flimsiest apologies for shelters with so many rooms crowded upon a given area that bedrooms and W. Cs. are often enough arranged where neither light or ventilation can reasonably be expected to percolate to them.

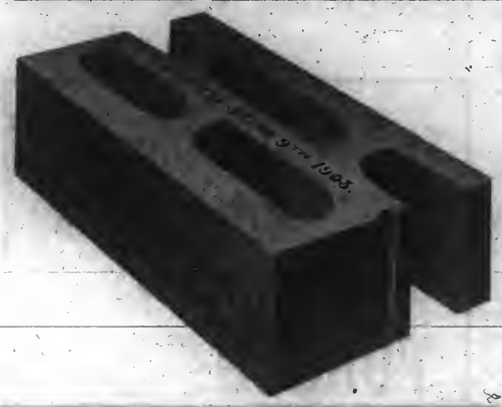
Amongst the larger housing schemes, the Montreal Land & Improvement Company are about to erect fifty dwellings mostly for workingmen on the lots between the Angus Workshops and Sherbrooke street. A large apartment house, to be known as the "New Sherbrooke," is to be built adjoining the present "Sherbrooke" flats in Sherbrooke street. It is to contain nine large and forty-one small suites of rooms with a general dining room. It is to be a five storey building of concrete fire-proof construction. Messrs. McVicar and Heriot are the architects.

In the same locality the Bishop Street Apartment House, designed by Messrs. Saxe & Archibald, is now nearing completion. At Raymond one proprietor is having nearly 60 dwellings in single and double houses completed for the 1st of May.

At the sitting of the House of Commons on the 16th of Feb., the estimates for public buildings in the Province of Quebec, were under consideration and funds were voted for several purposes. Important changes are to be made in the Post Office arrangements; $25,000 are to be spent on alterations to the Central office. The interior is to gain floor space by bringing the main wall forward to the street line. A site on the south side of St. Catherine street, close to the Renouf Building, was purchased some time ago, on which to build an uptown Post Office. A distributing station is to be placed on a site extending from the G.T.R. Square to Catbedral street adjoining the St. James' Hotel. This station will be connected with the central and with the uptown office by pneumatic tubes. A sum of $50,000 has been voted for the work. A similar sum has been voted for additions and repairs to the Inland Revenue Office. New additions are to be placed upon the small open square in front of the present building. Another building for which the Government has voted $20,000, is a barrack for the Permanent Corps. A site in Lafontaine Park may be requisitioned, but the civic authorities are endeavouring to provide a site elsewhere.

Last year most of the important building of the city was done

(Continued on Page 47)



"Something comes to him who waits, but he won't like the way he gets it."

That's It Exactly

WHILE you are waiting, the other fellow will get the only machine that makes the frost-proof double air space block and you will get it in the neck. *Order to-day.*

Frost Proof Fire Proof Damp Proof

MIRACLE PRESSED STONE CO.,

LEADER LANE CHAMBERS,

TORONTO, CANADA

Canadian Contractor's Hand-Book and Estimator

The third edition of the Canadian Contractor's Hand-Book is now on sale. The book has been revised and enlarged to upwards of two hundred pages and the title changed to the Canadian Contractor's Hand-Book and Estimator, considerable matter bearing on the cost of performing various kinds of work having been added.

The price of the third edition, mailed free, is $1.00 to subscribers of the CANADIAN ARCHITECT AND BUILDER, and $1.50 to non-subscribers. Order from the publishers.

The C. H. Mortimer Publishing Co. of Toronto, Limited

Confederation Life Bldg., Toronto
Alliance Building, Montreal
720-721 Union Bank Bldg., Winnipeg

DO IT NOW!

Have Us Modernize and Refit Your Old

FIRE PLACE

We Do All Kinds of Tiling Promptly and Accurately

We Carry a Complete and UP-TO-DATE STOCK OF FIRE PLACE FURNITURE

MANTELS AND GRATES

See Us About Your NEW TILED BATHROOM

THE...

VOKES HARDWARE CO., LTD.

111 and 113 Yonge St., TORONTO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited

Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understandiog exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 15th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	S. G. CURRY, "
2ND VICE-PRESIDENT	W. A. LANGTON, "
TREASURER	HENRY SIMPSON, "
REGISTRAR	W. R. GREGG, 96 King St., Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	"
J. WILSON GRAY	"
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD, Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal.
2ND VICE-PRESIDENT	R. P. LEMAY, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. R. BROWN.

P.Q.A.A. COUNCIL.

JOS. VENNE	Montreal.
E. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

[illegible], President.	
GEORGE DUTTON, 1st Vice-President.	CANNON, Jr.
[illegible]	A. MARSHALL.
JAS. CRANG, Treasurer.	GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

HENRY STRATTON, President.	W. [illegible]
GEORGE C. YOUNG, 1st Vice-President.	THOS. JONES.
JAS. S. LUNEY, 2nd Vice-President.	ED. MARTYN.
GEO. S. GOULD, Secretary-Treasurer. 478 English St.	GEO. YOUNG
	S. STEVELY.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M FRASER.
H. A. BELL, Treasurer.	E. G. BAYNES
T. BRADLEY.	D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. R. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGRAULT 2nd Vice-President. ALEX. NDER IRWIN, Sergeant-at-Arms.
Directors: T. G. Lailmer, E. Case, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girvin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.	JOHN DUTHIE
EDWARD M. ROBERTS, Vice-President.	P. LAHER.
G. J. SHEPPARD, Secretary-Treasurer.	JOSEPH LAMBERT, Jr.
J. H. HUTCHISON.	JAMES H. MASER.

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)

8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, Jr., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUS E Treasurer.	E z COTE.
N. T. GAGNON, Secretary.	LOUIS PAVETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
H. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

PERSONAL.

Messrs. Chadwick & Beckett of Toronto have taken into their partnership, Mr. Howard Bovell, jr., who has recently returned to Toronto after spending between two and three years in office experience in Chicago.

Messrs. Lawrence Munro and William R. Mead, architects, of Hamilton, have entered into partnership. They have opened an office at No. 10 Main street east, and will be pleased to receive manufacturers catalogues and samples.

TO RESTORE FADED MARBLES.—The lost colours of marbles may often be quite restored by washing with the strongest soap lees combined with quick-lime, about the consistency of good milk. This composition should be laid on the surface for a day and night. Finally remove it with soap and water, and the marble should be found as beautiful as ever.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

in the eastern part of St. James St.; and while the number of estate transfers, recently effected in the same street somewhat farther west, may foreshadow more building in that locality, people are expectant of more important improvements in the uptown district, more especially in St. Catherine street west. The City Building Inspector has recently drafted a by-law to regulate buildings in this street. This by-law very properly calls for substantial, durable materials in the construction of new buildings. It forbids the erection or adaptation of buildings for stable or factory purposes and contains the rather curious requirement that new buildings must be at least three stories high, and thirty-eight feet in height from the sidewalk to the roof. It is to be supposed that a demand so arbitrary would not in every case be arbitrarily enforced.

In the block between St. Timothy St. and St. Andrew St. on the north, Mr. N. G. Valiquette, who now owns nearly the entire block, is to erect a five storey factory, which will however face St. Andrew street. Messrs. Henry Morgan & Co. have, in a similar manner purchased almost the whole of the large block bounded by St. Catherine st., Berthelet st., Union avenue and Aylmer st., and intend to provide themselves with factory accommodation thereon. This scheme may take some time to develope, in order to allow certain of the existing leases to expire.

Farther west in St. Catherine St., on the south side between University St. and McGill College avenue, is the site for the uptown Post Office spoken of above. On the same side, some doors west of Real street. Messrs. Lindsay, the Piano dealers, are to put up a seven storey building. At the north-east corner of St. Catherine St. and Stanley St., Molson's Bank are to erect a branch. This is the corner at present occupied by Mr. Frank Norman's Stanley Hall, which will be built anew at 108-110 Stanley Street, at a cost of upwards of $30,000, with balconies on three sides to seat 800 persons.

Not far from here, at the north-west corner of Peel St. and Burnside Place, the Bank of Montreal have announced their intention of establishing another branch. The same Bank has already a branch at the corner of Mansfield St. and St. Catherine St., and intend to place still another on the south-west corner of Sherbrook and St. Lawrence Streets. The Bank of Hochelaga is adapting a building at the corner of St. Denis St. and Mt. Royal avenue, to the purposes of a branch. But, as in Montreal banks and their branches seem to breed like rabbits in a warren, it is useless to begin to try to enumerate even the latest additions to the family—they come so quickly.

In addition to a very fair share of commonplace substantial work, which promises to take shape in stone and lime in the near future, there seems to be a dim vision that haunts the mind of the Montrealers. This is of a magnificent hotel not at present located in any particular spot, but hovering most frequently about the block between Dominion Square and St. Catherine st. This phantom hotel, inspired we know not whence, seems to be a subject in which the imagination of the dwellers in these parts loves to revel. It is to cost fabulous sums of money of course, it is to be a place of next to heavenly splendour and excellence of management, and it is to be erected some day.

CONCORDIA SALUS.

McCORMACK & CARROLL

12 Lombard Street, TORONTO
Phone Main 2037

Carvers, Modellers and Manufacturers of

"COMPO" ORNAMENTS

For Interior and Exterior Decoration

- - WRITE FOR CATALOGUE - -

The RICHMONDT CONDUIT & MFG. CO., Limited

Sole Manufacturers of

Richmondt Electro-Galvanized and Navalite Godult Tubing and Fittings

For Absolute Safety in Interior Wiring.

Factory and Office: 15, 17 and 19 Jarvis St., Toronto, Canada

The Canadian Bridge Co., Limited

Walkerville, Ontario

··· MANUFACTURERS OF

STEEL BUILDINGS, ROOF TRUSSES

Railway and Highway Bridges and Structural Steel and Iron Work of all description
Estimates furnished upon application.

HOT BLAST HEATING SYSTEMS

FOR

SCHOOLS, COLLEGES, HOSPITALS, FACTORIES, AND PUBLIC BUILDINGS

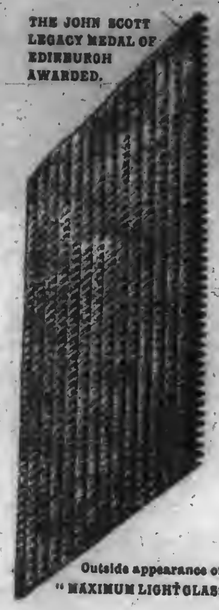
Using Exhaust Steam or High or Low Pressure Live Steam. Plans and specifications submitted. Steam Specialties, Fans, Blowers and Exhausters of all kinds. Engines for High or Low Pressure Steam. Particulars furnished on application to

SHELDON & SHELDON, GALT, ONT.

Formerly McEachren Heating & Ventilating Co.

MAXIMUM LIGHT GLASS

THE JOHN SCOTT LEGACY MEDAL OF EDINBURGH AWARDED.



Outside appearance of "MAXIMUM LIGHT GLASS."

MAXIMUM LIGHT GLASS acts on 40 per cent. more sky area, and increases the illumination to the extent of five to twenty-five times as compared with the ordinary corrugated or prismatic glass. Perfect interior lighting by daylight results through its use.

Sample Free. Booklet Free. Send for both.

THE HOBBS MANUFACTURING CO., LIMITED

Glass Importers and Manufacturers

LONDON, ONT.

"KELLY" Warm Air Furnaces

For Coal or Wood

PERFECTION is so rare an article that when met with it is sure to command attention. The most striking example of it in modern times is the "KELLY" Warm Air Furnace herewith illustrated.

The Combination of Sensible Features in this furnace is fast making it very popular in all parts of Canada.

The Dealer who wishes to get "in on the ground floor" will do well to place a sample order with us at once. We know that more will follow.

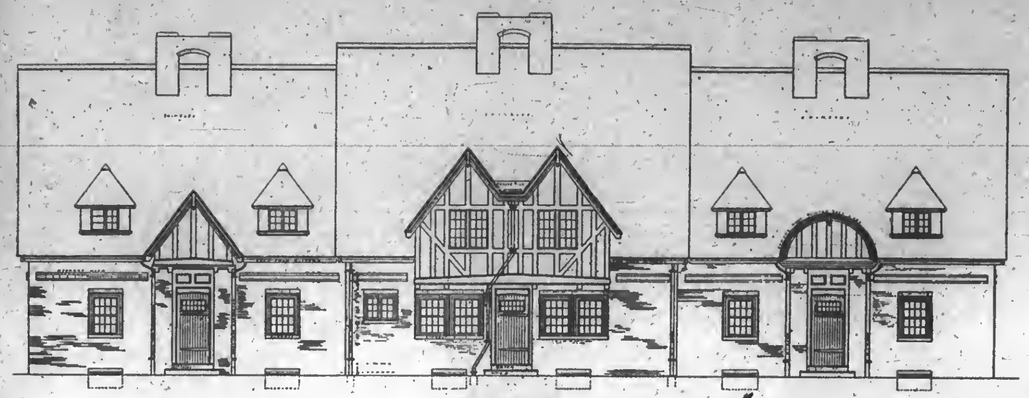
KELLY Warm Air Furnaces are made in four sizes with fire-pots 17, 19, 22 and [illegible]

[illegible] perfectly and will give your customers lasting satisfaction.

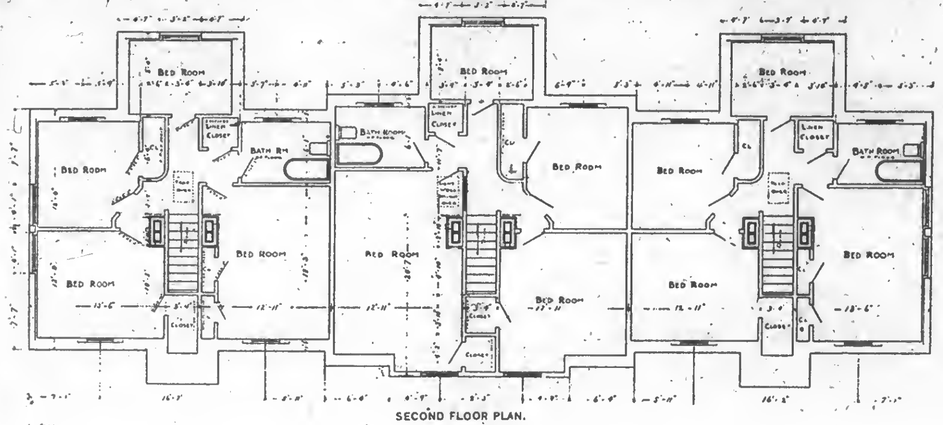
Send for Our 1905 Catalogue
It Will Interest You.

Guelph Foundry Co.
Limited
Guelph, Ont.

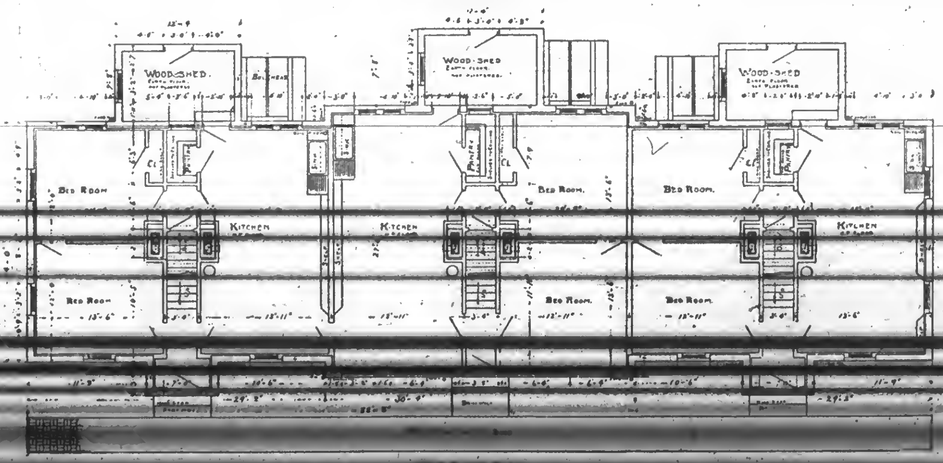
Branches: TORONTO, MONTREAL and WINNIPEG



FRONT ELEVATION.



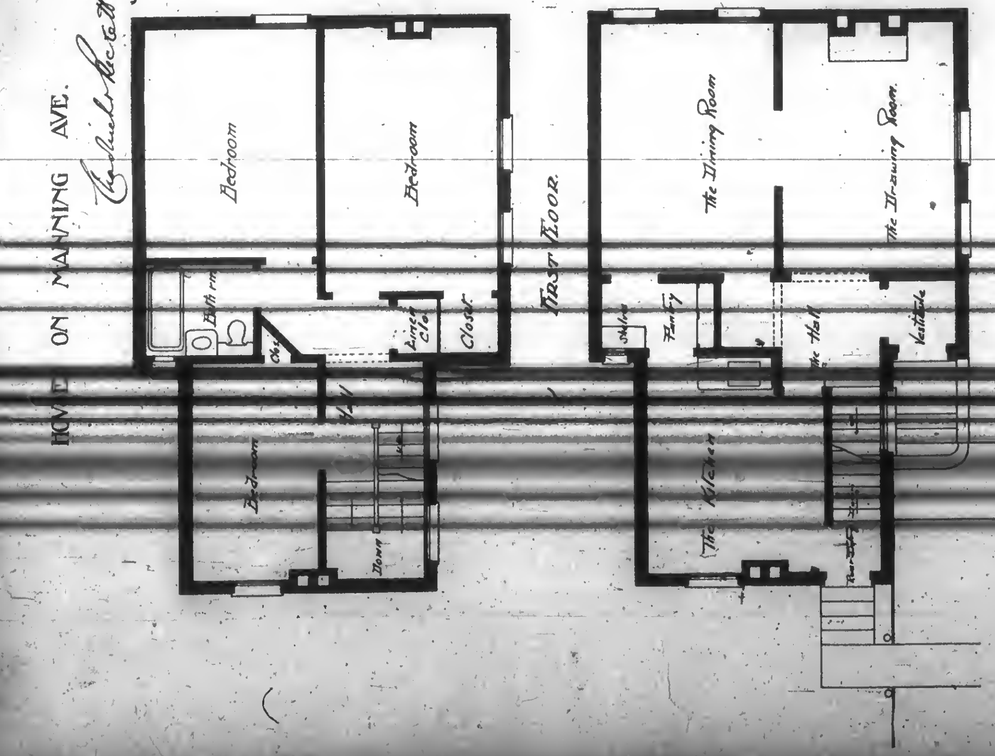
SECOND FLOOR PLAN.



FARM COTTAGES, ESTATE CHARLES FRANCIS ADAMS, ESQ., LINCOLN, MASS.
PHILIP B. HOWARD, ARCHITECT.

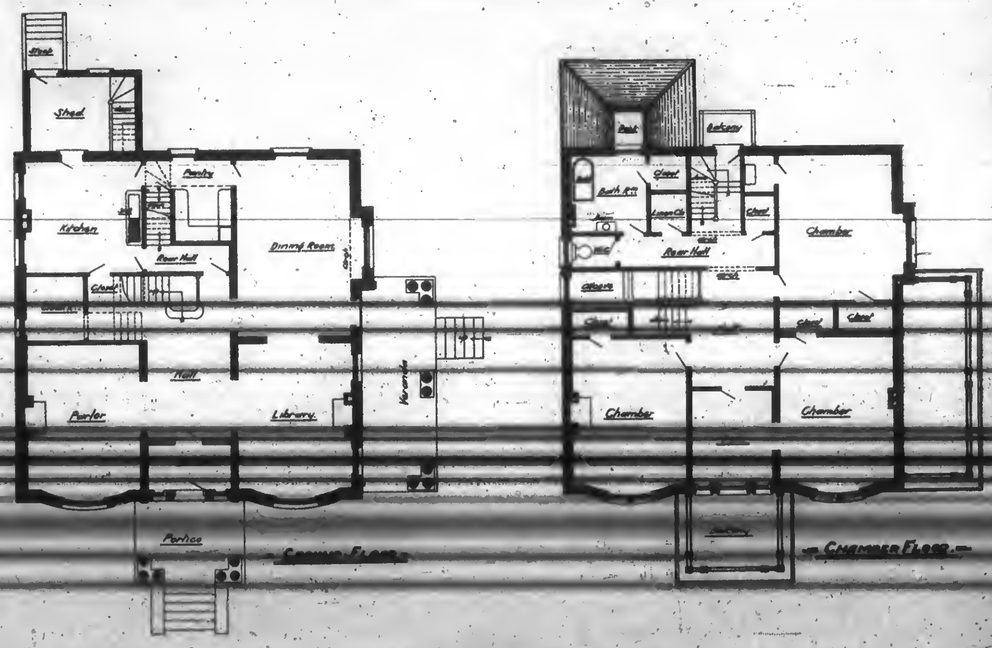
COTTAGES FROM THE "BRICKBUILDER."

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1905.



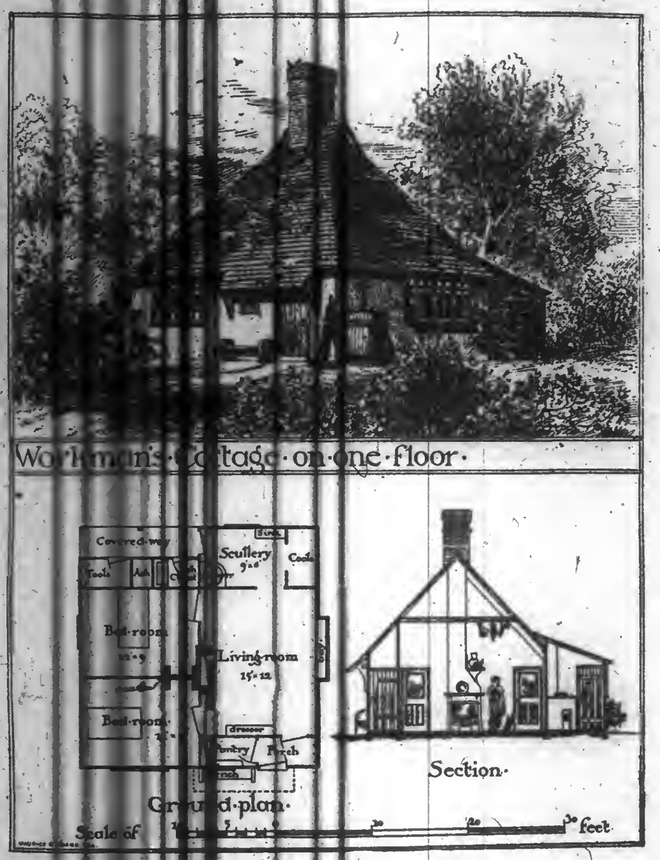
HOUSE ON MANNING AVE., TORONTO.
MESSRS. CHADWICK & BECKETT, ARCHITECTS.

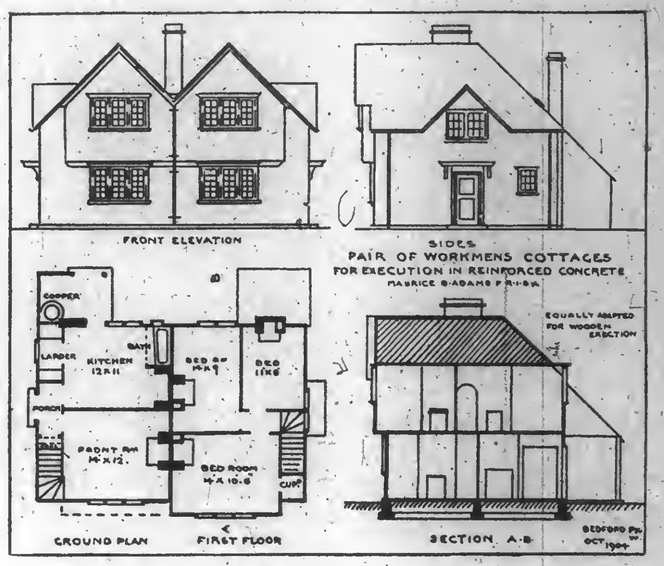
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1905

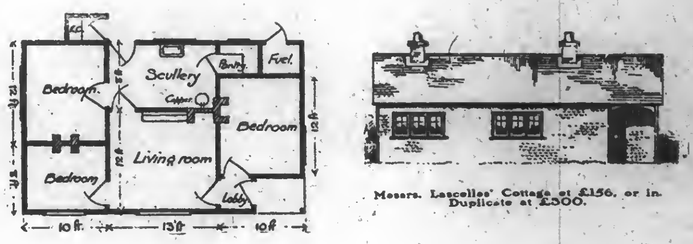


HOUSE FOR I. H. CHAMBERS, ESQ., WINNIPEG.
F. R. EVANS, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1905







ENGLISH COTTAGES, FROM THE "COUNTRY GENTLEMAN."

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1905

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
W. A. LANGTON - - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 208. APRIL, 1905.

ILLUSTRATIONS ON SHEETS.

Plan of Macpherson Estate, Toronto.
Cottage at Victoria, B. C.—S. Maclure, Architect.
St. Mary's (Anglican) Church, Portage la Prairie.—H. S. Griffiths, Architect, Winnipeg.
House of J. W. Siddall, Architect, Toronto.
House in Victoria, B. C.—S. Maclure, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Macpherson Estate, Toronto.—S. H. Townsend, Architect. View from North Side of Crescent Road looking East.
Macpherson Estate, Toronto.—S. H. Townsend, Architect. View from Crescent Road looking South to Cluny Ave.

CONTENTS

Editorial	49-50	Real Estate in Montreal	61
The Development of an Estate	51	Master Plumbers' Association of Ontario	62
Canadian Company to Make Fire Appliances	52	A Few High Structures	62
Our Illustrations	53	The Leek Radiator	63
Books	53	Wall Paper By-Law for Montreal	63
Civic Art Pays	54	Decision Against Boycotting	ix
Mr. John Belcher on the Study of Old Works	54	Financial Centre of Toronto	ix
Mr. Carnegie Entertained by Builder	55	New Method of Laying Concrete	x
Modern Methods of Financing Building Operations	56	Richardson's Building at Pittsburg	x
The Ideal House	57	Ignition by Sun	xi
The Campanile, Venice	57	Kitchen Ventilation	xii
Intercommunication	58	Against Sky-Scrapers	xii
Damages for Non-Completion of Contract	59-60	Montreals' Proposed New By-Laws	xiii
Montreal Notes	61	Plasterers have Settled	xiv

An Avenue of Sod.

A rather strange proposal has been made by a member of the Toronto Board of Control: to grass over the fine road, that leads to the Queen's Park and is the approach to the Parliament Buildings. The cause of this suggestion is the second road, University Street, which, in consequence of some early misunderstanding between the City and the University, runs along side of the Avenue. The proposal to adopt the side street as an approach, and leave the other as inexpressive as a walled up door, shows that it is just as well Mr. Spence is a controller, for as an artist he lacks imagination.

Overhead Tanks.

There will be a big spill some day from some of the sprinkler tanks that are set up on skeleton supports and left to the weather. Steel does not last forever; and, in the steel trestle work that usually carries these tanks, there are very slender members, which a little neglect could easily make too slender. And has there been enough consideration given to the effect of large fires upon the exposed steel? A little warping—a very little—and down comes the tank. However much comfort there may be for owners and underwriters in a 20,000 gallon tank propped up by steel, it must be a terror to firemen. Sprinkler tanks should rest on brickwork, and, for the sake of appearance, should be surrounded by brickwork. In other words a tank should impl[illegible]

The Montreal Architectural Club.

The foundation of a club for architectural students is a good move on the part of the Province of Quebec Association of Architects. According to the newspaper report of the proceedings, in the meeting at which the club was instituted, it is proposed to give instruction chiefly in design. It is an excellent idea to measure old buildings. They have old buildings in that province of which it is well worth while to preserve a record, and the building traditions are good and ought to be studied and find their place in work of the present day. But there is some drier work that the student will have to get hold of; and something in the way of the methematical instruction that is carried on by the Ontario Association of Architects, in conjunction with the Eighteen Club, is desirable also. The unusual number of students who came up for the examinations of the Ontario Association, which are just finished, shows that this instruction is appreciated by the students and is doing good.

Frozen Mortar.

A New York architect, who was present at the Convention of the Ontario Association of Architects, told the members that there is practically no difference made now in New York between bricklaying in warm [illegible] buildings in New York on the first warm day of spring is the other side of the question. Fortunately the warm day was a Sunday, so that there was no loss of [illegible] from two to three millions of dollars. The buildings were all large; five and six storey "flathouses;" and in two cases the building that fell was part of a row built concurrently, so that the character of the rows (in one case consisting of eight six-storey flathouses) is in question. It is against the law in New York to use mortar in freezing weather; but the authorities say there are not enough inspectors to prevent it. The national conception of the virtue of haste must, in any

case, give the inspectors little heart in their work when it is a matter of holding back building.

American Plans. Two new important buildings for Toronto have been put into the hands of United States architects; and the duty on plans is still collected on a valuation of the blue prints that come in, which is based upon the time supposed to be taken by the draughtsman in producing them. If there is to be a duty, it is not creditable that its collection should be made a farce like this. The government—not the present government but its predecessor—did acknowledge, at one time, that the thing imported is not drawings (and not blue prints) but services, and that the duty should be collected on the cost of the services to the importer.

The irritating point in the situation, to architects, is that the best architect in Canada would not be allowed to erect a hen-house in the United States. And another point, equally irritating, is that, where a United States architect is employed in Canada, he gets a much better chance in the way of expenditure than is given to a Canadian. His clients are, in fact, a good deal at his disposal. As they have sent to New York for an expert, it would be silly not to take his advice. The effect, no doubt, is to raise the high water mark of cost all round; but, in so far as that is a good thing, we ought to be able to find it out ourselves.

Posters and Dodgers. There is a bill before the New York Legislature to prohibit the use of advertising posters and paintings in all future subways. The bill has the entire approval of the public, we are told. Which proves one thing—that posters are not needed. A practical public, which objects to having posters where they can see them every day conveniently, is evidently quite satisfied that it can become acquainted with every article it needs without the help of posters, artistic or inartistic.

But this is only one step in the argument. Matter in the wrong place is dirt; and posters, in a place where they are not wanted by the people for whose benefit they are put up, can have no reason for being there but the advantage of the person who puts them up, and it becomes a very live question how far he has a right to make use of public places for pushing his own advantage—only his own—in this way.

Nor can he have any right to employ little boys, as he does, to throw papers on our lawns. If the little boys were to do this on their own account they would run away afterwards. Now they merely walk to next door and do the same. And the householder, who is equally injured in both cases, sees the law, which would be with him in the one case, is, in the other, with the boy, who is pursuing his lawful avocation. Why should there not be a law against dodgers as well as against posters? If they do any good to the advertiser it is only because they are so cheap that he can afford to have a thousand fluttering about the streets for one that is read. That is all very well; but can the rest of us afford to suffer from their unsightliness and to pay for their picking up?

Gibbon v. Pease. The appeal in this case has been dismissed with such a decided opinion about the unreasonableness of any custom which allows an architect to retain possession of his plans that it is evident the Court of Appeal has done more than merely confirm the application of the precedent case of Ebdy *v.* McGowan, in which, (a case of a building that did not go on), the architect was compelled to hand over his drawings, in order that the client might have, (as every commentator, if not the judgement, says), "something to show for his money." The case will, without doubt, go on to the House of Lords. If the judicial committee, who will take the broadest view possible to the legal mind in England, fail to support the architect's claim, the only thing left, to secure an architect's rights, is copyright. This would be so extremely difficult to carry out that the simpler course would be to start afresh and get legislation that will establish the architect as owner of his plans.

It is said that the American Institute of Architects, knowing the importance to the profession in the United States of the decision in this case, will offer to contribute to the cost of carrying the case to the House of Lords. The Quebec and Ontario Associations have even more reason to support the appeal, and, in spite of a tendency to deficit in their Treasurers' reports, would do well to support it with money.

In another column we reprint an article from the Architectural Review of Boston on this subject, in which the view is taken that an architect's drawings are like a legal document which, as the Engineering Record of New York said, in making the same comparison a little while ago, "unquestionably belongs to the client, although it represents the results of the lawyer's study and experience."

It is an extraordinary thing how impossible it is, for writers discussing this question, to keep things in their proper categories. Unless the writer in the Architectural Review is arguing that the matter for which the client employs an architect is the production of drawings, how can architectural drawings be compared to the draft of a legal document? The draft and the typed form are of one kind—documents. It is a document the client wants for himself, and it is for that he pays. But drawings and a house are of different kinds, and it is a house the client wants and pays for. If drawings were compared to a brief and the house to the argument in court, the comparison would be better. We may arrange the terms thus:—

Instrument of Service	Service	Fee
Brief	Argument	A favourable judgement
Drawings	All the business involved in the process of erecting the house	The house

It only remains in order to complete the comparison, that we should give the architect's client possession of the architect's drawings at the same stage or condition of the proceedings at which the lawyer's client gets possession of the lawyer's brief.

THE DEVELOPMENT OF AN ESTATE.

The Macpherson Estate in Toronto is an example of how land can be made the most of for building purposes without sacrificing beauty, and how profitable it is to aim at beauty. The houses on this estate have always been sold as soon as built—usually before completion. The attraction is partly in the house itself and partly in the certainty that the still undeveloped portion of the district will be equally attractive, so that there is none of the risk which often attends building in a new neighbourhood.

This result has of course not been accomplished without thought, and the ideas and methods which are at the bottom of the estate's success, as gathered from the managers, Messrs. H. C. and A. E. Boultbee, are the subject of this article.

The first consideration in a residential quarter is to make the most of the natural lie of the land; to avoid levelling as much as possible, and cultivate variety. Little more than this was attempted at first in Crescent Road, the portion called the Macpherson Estate. There was a road cut, sloping from a hollow in Yonge Street to the higher level; and truly no opportunity so slight has ever been made more of. The road not only sloped from Yonge Street but was cut out of the side of a slope which, though very slight, caused the lots on the upper side to rise a little above the road. This small advantage was the original source of inspiration for the development of this estate in an unusual way, more agreeable than the ordinary. The differences in level necessitating approaches by means of steps in the slope, and the variation of these approaches due to contour and a pair of old trees, suggested an irregularity in the alignment of the fronts which has done more to make the picturesqueness of the Macpherson Estate than is generally supposed by people who have admired the prettiness of the cottages. Several houses, in the hands of one architect or conforming to a properly studied estate plan, can lie backwards and forwards of one another with great mutual advantage, getting better views and more light, sun, and air.

In addition to the placing of the houses, the first efforts of the agents for the Macpherson Estate were deeply concerned with roads and sidewalks. And here we may begin a more systematic study of the principles of planning exemplified in the development of this estate.

In a residential district the roads and sidewalks should not be too wide. The most that will be required from the width of a road is to let two carriages pass one another at a point where a third or a line of carriages is standing against one curb. For this 24 or [illegible] rare, the decision of the designers of the Macpherson Estate for a width of 20 ft. evidently suits best the [illegible] a minimum of glaring road a minimum of dust and a minimum of cost to make and support. Automobile speeding is not desirable in a residental district and the roads need not be designed to suit its requirements. The roads should be macadamized. This is still the favorite form of road construction in London for the best neighbourhoods. A macadamized road is not noisy. If watered every day, it is not dusty, for it retains the effect of watering for a longer time than asphalt or brick for the reason, (which is another of its excellences), that it is not so hot. Continuous asphalting must contribute seriously to the heat of a city in summer. Macadam is less costly to make and less costly to keep up than other forms of roadway; and, which is not by any means the least of its advantages, it need not pass through a period of decline and shabbiness before it is renewed, but can be continually renewed, where it is beginning to fail, and need never be shabby at all. Finally, but not least in importance, macadamized roads have a natural colour and are pleasing to the eye.

Sidewalks should not be next to the road. There is a tendency in Toronto now to place them there. The reason is obvious: the boulevard takes the place of a lawn for the houses, and the building line advances in proportion and will without doubt, in small residential districts, ultimately reach the line of the street. Let it be so in these districts; if they must pack close to be cheap, let the street plan help them to any graces or comfort it can. But, when a property owner can buy enough land to free him on the sides, he ought to be able to free himself in front also by means of his own property. There is no occasion to invite him to lessen what he contributes to the spaciousness of the streets; nor is it right to make the street boulevard of more value to him than to the passers by, for whose use it is really intended. The use of the boulevard (speaking, as we are now doing, only of the single boulevard) is to keep foot-passengers away from the splashing, the dust and the danger of the roadway. A sidewalk next to the road exposes them unnecessarily to all these, and also, in summer, to the glare of the street, from which they should be cut off, walking behind the boulevard trees and getting the additional advantage for shade of whatever private trees there may be along the front of the lots. Two boulevards of course solve the question, where it is possible to consider perfection before expense; but, for the ordinary residence street, where, though beauty is a first necessity, it must be got at the cost not so much of money as of thought, and one boulevard is all that is compassable, it is essential to keep the one boulevard between the sidewalk and the road. In the question of beauty, there is too much dull colour in one mass, if the roadway and sidewalks are together. Though they are of the same family, they do not necessarily harmonize and are best apart. In this position also the climb from the road level to the sidewalk, for carriages or automobile entrances, is accomplished in the width of the boulevard and the sidewalk can be crossed on the level. There is thus no need for those dangerous level cuts in the outer edge [illegible] or in winter when the snow disguises them, a succession of traps for the foot passengers. When a sidewalk [illegible] walking abreast, needs to exercise watchfulness at [illegible] time, and in winter is in positive danger.

It is worth nothing, before leaving the question of roads and sidewalks, that, though there was some conflict between the trustees of the Macpherson Estate and the city officials, about the high prices paid by the trustees for sidewalks, for which the City had agreed to be jointly responsible, yet the cost of local improve-

ments per running foot of frontage is not much more than half the ordinary cost for residence streets, and less than half the average of such streets. This is a conspicuous advantage of macadam construction and moderate width for the roadway.

For the front of the lots the trustees of the Macpherson Estate believe in fences, but substantial fences or else hedges. Wood is in fact an ephemeral material and nothing made of it can suggest that idea of durability which is an essential element in the effect of architecture upon the beholder. To have stood for generations past gives character to architecture, apart from the weathering of time. It is the mere fact of durability that impresses us. And this impressiveness can be shared by new work which, though it has not stood for a long time, yet suggests by its appearance that it will. Masonry of some kind is the only architectonic material for a fence. Hedges also are satisfactory, as belonging to the ground. But wood is not satisfactory about a house, except as a support for plants. Under this head a rail or two, to support and guard a hedge on the outside, is not amiss. But, rather than wood, no fence is preferable. In the Macpherson Estate this has been practised where the lots rise above the sidewalk, and the effect is good. On the level (where they have fences) the practice would not be so satisfactory. But it is a middle term between durable fencing and wood; and it has this to recommend it, that, where there is not a double boulevard, the sidewalk gets the effect, which is so pleasing, of running along, a narrow band of stone or brick, flush with the grass on either side.

In the rear, where fences are necessary, it has been found also necessary to make them of wood, on account of the expense of masonry. But beauty on the inside of the lot is a leading principle in the development of the estate, and instead of the crude post and rail fences, that are so common in Toronto, the architect has made panelled fences, equally pleasant to the eye on both sides, and stained them with creosote stains. With a small portion of the rear fenced off, to make a kitchen yard, the rest is a garden; and, where all neighbours equally have had the interior of their land made into a garden, the views from rear windows are as pleasant as those from the front, or more so; so that a house that faces north can have its living rooms to the south, where they ought to be.

The beautification of the interior of the lots is perhaps the most important rule of all to establish in a neighbourhood; for it makes aspect planning possible for every house, and prepares the way for variety in placing the houses. Where there is no rule, there is no safety but in looking rigidly upon the respectable [illegible] understood practice, to which public opinion guarantees conformity, as on the garden side of the London residence blocks, makes it possible to go a step far-

houses are jammed together in rows), and lay out an estate, as the Messrs. Boultbee have done, with an eye to a varied presentation of the fronts to the lines of view.

This last development, which contains all the conditions arrived at before, is shown in what is called the Chestnut Park Estate, formerly the site of Chestnut Park, Sir David Macpherson's residence.

Chestnut Park Road* has, at the bottom, the principle of a crescent; that is to say it serves only its own houses, and through traffic passes it by. People living in Chestnut Park Road, or the short roads that connect it with Roxborough street, will have only such disturbance from carts as is necessary for the supply of their own needs; and street car extension will not change the character of their property. There ought to be more of such self contained blocks in Toronto.

The other advantage of a crescent road—the continually changing presentation of the fronts to the eye—has been retained in the long line of the road from east to west, by making this part of the road a succession of curves. There is thus, continual variety. The rounded corners have much to do with this. A corner rounded off is of course land given away to the city; but liberality in this way is not depriyation if it can be made to improve the lot itself and the outlook from it.

A great part of the variety of the Chestnut Park Estate will lie in the consistently rounded corners. In the first place there is the agreeableness of the curve and the satisfaction of cutting corners; every road is given an easy line in every direction and the sidewalks serve the foot-passenger even elaborately, curving to make short cuts in every direction.* But it is in what is left that the beauty chiefly lies. Between the lines of traffic there are dead spaces, of areas proportioned to the extent to which the corners are rounded. At the top of the most easterly, north and south road, where it joins with Chestnut Park Road, the diagonal of the jnnction is about 125 ft., and the island formed between the road curves is over 60 ft. on a side. The other islands are of different sizes; but the least is 27 ft. on a side. So that there is room on every island for a large tree, or a plantation of shrubs. What the results of this will be, in the way of beauty, can be easily imagined—and it all proceeds from the rounded corners. The houses on these corners will naturally have their axis on a diagonal of the crossing and face the islands. The resulting arrangement of the houses in one of the blocks is shown in the plan. It is proposed to fence off a small kitchen yard for each house, and treat the remainder of the lots as gardens. At present this particular block is covered with apple trees, and it will probably remain so in great part.

It should be added that there will be no electric light poles, for the managers of the estate have decided that for a good residential district gas is preferable, and the telephone poles have been kept off the street, running at the back of the lots, (ultimately it is to be hoped, to go underground).

The place is fast building up and will not be long before its beauty should appear. It should not be long either before its example is followed elsewhere; for the effort to make the Macpherson Estate beautiful has made it a commercial success, and the owners of other estates cannot do better than aim also at a comprehensive scheme, which, by securing for a neighbour-

property.

* See Plan on Illustration Sheet.

CANADIAN COMPANY TO MAKE FIRE APPLIANCES.

A company, with $100,000 of capital, has been organized, to deal in fireproofing materials, fire preventive and extinguishing appliances, and devices for safety against fire, such as autoniatic alarms, automatic sprinklers, etc. Mr. J. A. C. McCuaig, late secretary of the Toronto Board of Fire Underwriters, has accepted the general management.

*The resulting circular form at the crossings was not part of the designers' intention, but resulted from the natural curves when they were all laid down.

OUR ILLUSTRATIONS.

HOUSE OF J. W. SIDDALL, ARCHITECT, TORONTO.

This house is of yellow pressed brick, white woodwork and black slate. The entrance is on the west. The window in the drawing room is placed to catch a view across one of the ravines. On the south the angular end of the dining room and a slated gable above, with the chimney on its face to one side, make, in combination with the front, a view rather more interesting than that here shown. The angle in the end is made in the brickwork without cutting; leaving as a projection the part of the brick which would be cut off if the bricks were shaped to the splay.

HOUSE IN VICTORIA, B. C.—S. MACLURE, ARCHITECT.

The inhabitants of Victoria are said to be chiefly English immigrants. This house is suggestive of England, in spite of its wooden construction, because it is evident that the living rooms turn inward to a garden. The American plan of making the living rooms "give" to the street tends too literally to unreserve to make the most of the house for what the American is so fond of calling it—a home. If this Victoria house is a type of all Victoria houses, the question is suggested how far the practice of looking towards the street is an effect of climate. A winter with snow does not suggest gardens; in particular, small, enclosed gardens; and that Victoria houses do not follow the custom of the rest of the country, but have taken naturally to the English "garden front," may be the consequence of gardens, in Victoria, being green all the year round. Yet a snowy garden is better than the street; and snow, after all, is not on the ground for long in the year. The American leaning to French design must surely in time produce a desire for the small interior garden which adds so much to the charm and dignity of houses in the towns of France.

COTTAGE AT VICTORIA—S. MACLURE, ARCHITECT.

A plan of this house is hardly necessary. The simplicity of the exterior is due to the disposition of the rooms round the entrance—parlour, north and west; dining room, south and east; kitchen, north and east. The small window in the middle of the south front probably lights the hall, and is opposite to a staircase on the other side leading to the bedrooms. This is a good contribution to the small house problem.

ST. MARY'S ANGLICAN CHURCH, PORTAGE-LA-PRAIRIE. H. S. GRIFFITHS, ARCHITECT, WINNIPEG.

This church was built about four years ago. It has been the good fortune of the architect to build where there is stone, and also to understand that the proper treatment of the material is simplicity.

PLAN OF THE MACPHERSON ESTATE.

The plan of Chestnut Park Road, the second portion of the Macpherson Estate to be developed is the work of Messrs. H. C. and A. E. Boultbee. The motives [illegible] the

page 51 dealing with the development of this estate.

VIEWS IN THE MACPHERSON ESTATE—S. H. TOWNSEND, ARCHITECT.

These houses are all of red brick, with roofs and and projections shingled and stained in low tones. The view on Macpherson Avenue was taken with the purpose of showing rather the placing of the houses and the treatment of the ground than of exhibiting fully the houses themselves. The site was not regarded as a very promising one for residences until Mr. Townsend, seeing the advantage of the slight inequalities of the ground, evolved the idea of an alignment of judicious irregularity, founded upon any individuality observable in the lot. The houses were designed one at a time, but all by the same architect, who was therefore able to work out his idea completely.

Since the building scheme has increased and land, is sold instead of houses, the work of other architects has become included in the estate. In the view of Cluny Avenue, the house on the extreme right is by Mr. Eden Smith.

BOOKS.

PLANK FRAME BARN CONSTRUCTION; by John L. Shawver. Published by David Williams Co., 232-238 William Street, New York. Price 50 cents. This little book is intended for country readers. It gives directions for building barn frames of planks instead of timber. The system is said to be much in use in the Central West of the United States and has much to recommend it. There is a saving in both timber and labour, and the method of framing which dispenses with cross ties and constructs, with a system of triangles and long braces, a sort of angular catenary arch over the barn floor, allows the hay slings to run without hindrance from end to end. The writer claims greater durability also for this form of construction, because there are no mortises in which moisture may accumulate and cause the tenons to decay. He has been engaged in building barns in this manner and gives examples of the length of time taken. E. g. a basement barn 40x80 with 8 ft. basement, 16 ft. superstructure, and plain gable roof was begun by the writer on Wednesday morning, with three carpenters to assist him, and raised complete on Saturday of the same week. A dairy barn 100 x 36, with 8 ft. basement, and 16 ft. superstructure, framed by four house carpenters and two labourers, was begun on Monday towards noon and raised on Friday, in six hours, with the help of 30 men. And, more directly to compare plank framing with mortise framing, he states that he, with 3 helpers, framed a barn, 40 x 72, with 20 ft. posts, while two carpenters, framed the sills for a corn crib 5x40.

FERRIC AND HELIOGRAPHIC PROCESSES: A hand book for Photographers, Draughtsmen, and Sun Printers. By George E. Brown, F.I.C. Published by Tennant & Ward, 287 Fourth Avenue, New York. Price $1.00. This is a manual for the use of persons who wish to prepare their own sensitive papers. For photographers who want to govern their results better, or to use paper of any surface they choose, and for architects, [illegible] larly of paper for the use of architects,) for the preparation of paper for the Ferro-Prussiate or ordinary [illegible] Sepia prints. A chapter on "Prints on Fabrics" suggests the possibility, (with some pains, apparently,) of preparing silk, linen or cotton to receive printing. The chemical preparations may be applied with a sponge by gas-light, requiring nothing but a table; but drying must be speedy and in the dark (a closet with a coil at the bottom is suggested) and there is a good deal of preliminary chemical work of an exact nature.

CIVIC ART PAYS.

Some one may ask: But what difference does it make whether a city, town, or village is beautiful or not? Many answers might be given. One might point out the value of culture, the stimulating and ennobling influences of art, its importance as an educational medium, and its effect in increasing the economic productiveness of the laborer; but the person who would ask such a question in this day will appreciate but one answer: It pays. There is competition between cities and towns, just as surely as there is competition between business men. Every town strives to attract to itself the wealthiest, brainiest, and most progressive men of the country. Its future growth and influence depend upon its success in doing so. If it offers superior advantages and attractions, it succeeds. Now, one of the determining factors is the appearance of the town itself. If it is beautiful, men prefer it; if it is unsightly, they go elsewhere, and with them go their wealth, influence, business, and ability. This is true of all cities and towns, but it is particularly true of smaller centres. A metropolis has many other advantages to offer; the town or small city has few, and must therefore utilize every one to its full extent.

Civic art pays more directly. It is said that tourists annually leave Italy a sum of money equivalent to the interest upon the whole national debt. Many of the towns in Italy and Greece would be desolate and forgotten to-day were it not for the wonderful master-pieces of art handed down from ages long past. The thousands of Americans who visit Paris every year go there largely because Paris leads the world in civic art, and the sums spent there play no small part in the city's budget.—Milo Roy Maltbie, in the 'Chatauquan.

It is impossible not to recognize that beauty and cleanness in a town and ease of intercommunication between its parts will make a town attractive, and that the cost of giving it these qualities is likely to be repaid. This is an argument with which to make it politically possible to move in the direction of improvement; and, no doubt Mr. Maltbie is using it for this purpose. But let men who have no desire for beauty in their town, except as a means of attracting money, be kept out of the control of active operations to improve its beauty. They will only vulgarize it, and drive away those who are wealthy enough to have seen a little, and brainy enough to have learned the look of a good thing, and progressive enough to pass a bad thing by. It is only people who have a liking eye for their own town, and who want to make it beautiful for themselves, who can be trusted to preserve its attractive qualities while adding to their beauty. Emulation as a motive can only produce imitation; the introduction of fashion instead of taste. And, if there is competition between two towns over the same kind of claims to beauty, we may be sure that the necessary ostentation will not be one of refinement but of swagger. If we must appeal to vulgar motives in order to loosen purse strings it would be a good thing to let this kind of appeal end there; but this may be difficult and the difficulty raises the questions whether such an appeal is really necessary at all.

THE RULE WAS TOO SHORT.

Pat was busily engaged laying brick one day, when

"Pat, go back to the end of the building and measure the length of the foundation for me."

Pat vanished, and after a stay of some duration returned.

"Well, Pat," said the foreman, "did you measure it?"

"I did," answered Pat.

"How long was it?" was the question.

"Altogither," answered Pat, "'twas as long as me rule, me arm, an' two bricks."—Lippincott's Magazine.

MR. JOHN BELCHER ON THE STUDY OF OLD WORK.

Mr. Belcher in addressing, as President, students of the R.I.B.A., upon the subject of studying old work, said as follows:—

I want to take this opportunity to emphasise the importance of a more systematic study of those buildings which are universally recognised as good. "Quod semper, quod ubique, quod ab omnibus"* is a dictum which we may very well borrow from the theological schools and, having borrowed, stick to. Moreover, I should like to suggest certain methods to be adopted in the study of such examples. The student's first impulse, perhaps, is simply to annex the whole subject as "stock" or "copy." Now, certainly it is a very right and proper thing to sketch the building as a whole; but while doing so we must not let our thoughts lie idle; we should endeavour to discover why the subject is beautiful or admirable, what are the elements in it which have contributed to that result. At first, it may be, such an effort seems to go unrewarded; but if the habit be persisted in, intelligent perception will awaken, little by little the light will grow, and soon it will be quite easy to disentangle from the mass, as it were, those characteristics, those laws, those conditions, which have made the building what it is. While traversing some particular line, for instance, note its relative proportions to the other parts. Follow out, if you can, the methods of construction, and mark how the effects are produced. Examine the general masses from various points of view, and study the composition of your subject, not only in respect of its component parts, but also in relation to its environment. The latter is of great importance, for one of the chief elements of success in a building is its adaption to its surroundings. Here it is especially that "scale" comes in, for the scale of a building must be either in keeping with or in contrast to adjoining buildings or objects, just as colours must either match exactly or be complementary to one another. Scale is relative, and determines the proportion of one part to another and of the several parts to the whole. It is like the dominant note or key in a musical composition. You are probably all of you aware that sounds which harmonise and please the ear have fixed relations to one another. Colour also has its divisions and harmonies, and you will not get far in architecture without discovering that here also similar laws hold good, and that there is such a principle as a true proportion of parts in the scale of building. It is only by a diligent study of and a careful regard for these laws that we can effect a harmonious composition, which all the same can never be merely mechanical in architecture, any more than it can in music. There is as wide a range of possible combinations and developments in the one case as the other. The great architects of every age and every country have exhibited as wonderful a variety of progressions and characteristics as can be found in the works of Mozart, Beethoven, Mendelssohn, or Wagner. You shall also have regard to the aspect of the building you are studying, whether it is situated in the narrow street, the broad thoroughfare, or, or in open ground. Note how the projections and lights and shadows are determined on each frontage. Where the sun penetrates reflected light may be [illegible] projections and shadows on a south front are by no means the same as they would be with a north aspect. How well Vanbrugh, amongst his insistance on this point is so obvious. It is only thus by analysing and searching out the guiding principles which have actuated men in the past that we shall really profit by a study of their work. If we can discover the sequence of thought which has guided them in the achievement of fine results, we in our turn may, by taking thought, successfully work out the problems which come before us. Depend upon it, that which we admire in their work is not the result of careless, accidental, or haphazard arrangement of materials. No, there is thought behind it all—sometimes naif and immature, and sometimes even "smelling of the oil"; but there it is, and the best results are just those upon which the best thought has been expended. If genius is not, as it has been defined, "an infinite capacity for taking pains," at any rate in architecture, it is very nearly akin to an infinite capacity for taking thought. The best thought, however, does not advertise itself, and the best work is not necessarily that which first arrests our attention. How often has it been our experience in the past, when going to a place a second or a third time, to come across some excellent building which altogether escaped our notice on a previous visit. Rely upon it, such a building will repay careful examination. Do not be misled by the apparent simplicity of much of the best work, for this very simplicity, if not the outcome of profound thought, is the triumph of a practised genius. Through the Complex to the simple is almost a law of mental evolution. Do not, therefore, fall into the error of a certain member of a building committee, who remarked to the assessor in a competition: "I cannot understand why you have put So-and-So's design first. It is so simple—anybody could draw a plan like that." When it was pointed out to him how difficult the other competitors had found their task, and how complex and incoherent some of their designs were, it began to dawn upon him that perhaps there was more in Mr. So-and-So's design than met the eye of a casual member of a building committee, When you are making a study of a subject, it is upon the work as a whole that you should concentrate your critical acumen. Do Do not allow your attention to be diverted by attractive or suggestive bits, and do not wander off into the by-paths of archæology.

When you study mouldings, for instance, or similar features of a building, do not regard it as an opportunity for speculating what date, style, or period it belongs to; but regard it from the point of view of its true purpose and meaning. In the case of the mouldings, consider not merely their beauty of form, but their effectiveness in affording shadow and protection. Archæology has its place, but it should be kept there; it often usurps the interest and attention which ought to be given to the example as architecture. The glamour of historical romance has served to invest many a building with a purely factitious value. The accidental effects of age and decay appealing to the sentiment of the man pervert the judgment of the artist, to his own detriment and that of his art. This same sentimental halo, hanging around all that is ancient, is responsible for the many imitations, forgeries, and effectations which have so long dogged the footsteps and hindered the progress of genuine architecture, and which in, some cases have proceeded to such an extreme of absurdity as to tempt men to forswear the past altogether, and to rely upon their own creative faculty to invent something altogether new. This is the other extreme of folly, for folly it is to think that our inherited traditions can be safely ignored, or that buildings which have stood the test of time and critcism have nothing to teach us. They are, on the [illegible] we shall unearth many a hidden treasure. They put before us problems—and their successful solution. They portray many various methods and effective combinations, suitable forms adapted to different materials, elements of beauty and strength which, if not always entirely realised, are yet present as an ideal which we may all study with advantage and strive to express in our own work. So I say to you, my youthful fellow-students, steer an even keel, if you can, between the Scylla of a superstitious and sentimental regard for the past and the Charybdis of a contemptuous indifference to all its works. If an example is merely old, leave it alone; if it is artistically good, approach it with all reverence and, examining its structure within and without, endeavour to discover the secret of its charm.

Do not make the mistake of supposing that you will necessarily be able to define the exact nature of the secret. There are principles of architecture as absolutely reliable, and yet as vague and ill-defined, as much "in the air" as the laws which govern musical progressions or the methods which underlie true literary form. In no one of these cases can the subtle secrets of the art be distilled in the form of express and mechanical rules. If we desire that our own powers may be moulded and guided on true lines, we must, as it were, live in the storehouses, continually absorbing the spirit of the masters as embodied and expressed in their works. Centuries of experiment and criticism, generation after generation of trained perception and cultured intelligence, have gone to determine what is good, what is beautiful, what is true. Shall we throw away the result of all this? Rather let us recognise and admit that our knowledge should be based upon the experience of those who have gone before, and our taste trained and refined in the study of the cultured monuments of the past. As Professor Clausen has said in reference to paintings, "The work of our own times may lose its freshness and interest in a few years, while the older works still hold us with an increasing charm." There are many ancient buildings in our own and every land which hold us with an ever-increasing charm—a charm attributable to their simplicity and self-restrait, their sincerity and directness of purpose, the straightforward and appropriate way in which they declare their object and intention. Every such building will be found to possess a vitality of its own, which so far from ignoring traditional methods, has taken them up and carried them on a stage further. So now the proportions and values which have determined good effects in the past must hold good to-day. The needs of the time, it is true, call for special and characteristic expression. We may have to readjust. to combine afresh; but every new departure, if it is to be true and lasting, must take the old as its starting point, the past as its basis, that which has been already accomplished as its foundation.

*"What (has been accepted) always, everywhere, and by all."

MR. CARNEGIE ENTERTAINED BY BUILDERS.

A noon reception was given at the Builders' Exchange, Cleveland to Mr. Carnegie on March 9. It is said that the largest crowd ever in the Exchange was present. Mr. Carnegie having been presented to the members of the Exchange by the President, in a complimentary speech, replied. In the course of his speech, Mr. Carnegie said:—

"I am very glad to see you all together here competing for trade. It is the best of systems. Many people think that competitors are bitter enemies. But it is not so. I have some of the closest friends who were formerly my competitors.

"If a man be true to the judge within he has nothing to fear. That is a great principle in life, but there is one other as great, and that is, a man does not live unless he walks through life surrounded by a circle of friends."

"A man hates only those he doesn't know. I knew my competitors and among them were my best friends. Get together and learn those whom you would hate [illegible] I am a great believer in a young fellow's doing something for himself. That acquaintance with his neighbors, his consultation and exchange of ideas with them is the first thing I would have a young man do for himself. It is the best thing [illegible], one of the foundations of life itself.

"At the close I want to thank you for the pleasure which you have given me this noon. As long as I live I think I shall remember this meeting."

Following the speech-making there was a period of hand-shaking. All were given an opportunity of grasping him by the hand, and for many he had a pleasing word. After the reception he attended a luncheon given in his honor by the directors of the exchange, and entertained the latter most happily for upwards of an hour with ancedote and conversation.

MODERN METHODS OF FINANCING BUILDING OPERATIONS.*

By Charles W. Russell, of Clinton & Russell, New York.

The methods of financing building operations vary in different places. In New York many schemes have been adopted for a while, to give place at length to other methods.

For example, when apartment houses were first introduced they became very popular. Then what was known as the co-operative apartment house scheme was invented. The promoters would get the refusal of a piece of land, have plans drawn and organize a company of people who wanted homes. The plan was to give the owner of a certain amount of stock a perpetual lease of an apartment (very similar to the custom an in Venice of different floors in a building belonging to different owners.) A great many large apartment houses were built on this scheme, but after one notable instance, in which the mortgage was foreclosed and the stockholders wiped out, this method was abandoned.

Formerly much of New York city was built on leasehold property, and many of the finest stores are on leased land, such as A. T. Stewart's (now John Wanamaker's), Tiffany & Co., Union Square; W. J. Sloane, and others. But at the present time very little is loaned on leasehold, and it is almost impossible to finance a large proposition in New York, if the fee of land is not included.

This is not the case in Chicago, where many very large and high buildings are on leased ground.

Most of the dwellings in the large cities of the world have been built by operators building rows of similar houses and selling them separately. This form of operation appeals to a large number. Men of small capital can start in a small way, and by investing their profits in more houses often build whole neighborhoods. They are usually successful during rising markets. Of course, houses reproduced a number of times can be built more cheaply than separate houses.

The plan of finance is often to employ an "architect" to make the plans of one house. A loan is then procured, and the different subcontractors are induced to wait for their final payments until some of the houses are sold.

But there are many builders who built very good houses to sell, in New York, and a large number of fire-proof residences have been built and sold, and not a few have brought between one hundred thousand and two hundred thousand dollars each in the last few years. There are very few private residences built at present on Manhattan Island, apartment houses being the vogue.

In the financing of a building operation, the promoter has usually to provide the difference between the amount of money that can be borrowed on the enterprise and the cost of it. The permanent loan is usually made by a financial institution on a conservative basis, loaning only 50 or 60 per cent of the value of the enterprise at a low rate of interest. If the conservative institutions decide for certain reasons not to loan money, there is very little promoting done until they wish to again loan. Of course, there is a great deal of money loaned by private individuals, but their loans are generally of smaller amounts.

[illegible] ing and selling the mortgages to private individuals. Thus, the financial institutions have the first claim on active business or not. If they are desirous of loaning, there are always operators who are anxious to promote enterprises.

As the size of operations in this country has increased to enormous proportions, so have construction companies, been formed with very large capital. Some of these have increased their scope until now they will underwrite the mortgage and assist in financing the whole operation and build the building. This class of operation is almost exclusively confined to central and staple property.

A popular mode of precedure for men who wish to to operate in real estate, is to form a company, usually called a realty company, and for each particular building operation a subsidiary company is formed by the parent company, which method, under the laws of the State of New York, eliminates the element of personal liability of the stockholders.

There is a large field for these realty companies, managed on conservative lines, and they are of great advantage to people who are forced to inprove their property. It may be that their buildings are too poor to compete with new neighbors, or too old, or that they have been destroyed by fire, etc., or for other reasons. For example, a man has a piece of property in a business centre which he is forced to sell or improve, and which is appraised at, say, $1,000,000; it does not carry itself, and there is not a ready sale for it at that price. A realty company might make the following proposition, viz.: To erect on it a building costing, say, $1,000,000; to pay him for his land $600,000 in cash and $400,000 in second mortgage bonds of the company. The realty company would borrow from a financial institution, say, $600,000 on the land, and say $500,000 on the building as it progresses. After paying the owner $600,000, they would have $500,000 in cash for the building, and the stockholders would have to put in the balance, $500,000, and own the equity. In some instances the company issues no second mortgage bonds, but only stock.

There are many men who are forced to sell or improve their property, and while they have not the means to improve it themselves, they would prefer to keep an interest in it to selling it altogether, and they also feel that the experts in the realty company know better than they what the nature of the improvement should be. Perhaps the owners are not in this country, or perhaps they are not in a position to wish to take much trouble in posting themseves as to the requirements.

Some proposition like the above, in which they retain stock, naturally appeals to them. Of course, if the realty company puts in very little cash, it may prove a poor operation for the owner of the land, as he is taking most of the risk, and had better get most of the profits.

The financing of large building operations has been tried on very much the same lines as railroads are financed, that is, issuing bonds and stock in shares of, say, $100 each. Also large operations have been put through in Boston, I am told, by selling only stock in small shares without the property being bonded, and again other large operations have successfully carried out by selling first mortgage bonds in small amounts. The stock in such an instance representing no payment in cash, but professing to represent the earning power over expenses.

These plans have not been popular in New York.

Real estate has increased so much in value in large cities that it would not be possible for most men to invest in it if it were not through these companies. While formerly only the rich were able to participate in large enterprises, now, through the large corporations, the people can be interested in all the great enterprises of the country.

Building loan operations in great numbers have been started for persons who wished to build homes. Under [illegible] plan the tenant gets the property upon the payment of a very small equity. He then, in lieu of rent, [illegible] gage, in addition to the carrying charges.

The question How much will a building cost? and, When will it be finished? are of the greatest import to the financier. These questions depend largely upon the labor conditions, on which subject the architect and his client, the owner, are not usually given a chance to be heard, although the owner is the greatest sufferer from strikes and lockouts. His interest account is going on all the while, and he has very much more at stake than the builder.

A company that could give a guarantee to finish a building at a certain time for a certain amount of money would indeed facilitate any building operation Let us hope that this may soon be the case.

It is not the province of the architect to formulate the financial scheme or to place the securities of the project. He may be called upon to design a new building, introducing features which will make it superior to its competitors. He is usually expected to prepare preliminary plans, specifications, and to give an estimate cost of building, carrying charges and operating expenses in the shortest possible time. He should theoretically not put in anything that is not of use. He should at the same time make his building pleasing to the public, without adding necessarily to the cost.

Assume, for instance, that it is proposed to finance the construction of a high office building in some great centre. To insure a good income, the requirements, above the first and second storey, would probably be to have as many windows as possible, not too large to be easily operated and yet as large as practicable.

Each window would be separated from each other window, preferably by masonry, as it is advisable to have as little steel as possible exposed to the elements, but steel thoroughly covered with cement masonry is supposed not to deteriorate.

Projections over adjoining property should be dispensed with to avoid legal complications. Many title guarantee companies discriminate against such encroachments. A large cornice is a disadvantage to windows under it.

Therefore, the requirements which confront the architect are a flat wall pierced with windows at equal intervals, like a waffle iron, and not even relieved by a large projection.

Although this is a very difficult proposition, it is certainly a very interesting one.

The high building is essentially American. It is a new proposltion and requires more originality to solve than a problem where some historic example from the Old World may be taken as a prototype.

Would it not seem as if these requirements might best be met by the application of colors? If some one would use bright colored terra cotta, for example, omitting large projections, but with a handsome sky line, make a beautiful building, he would indeed deserve the thanks of the community. For the skyscraper has come to stay, and the business centres of our large cities will be rebuilt.

The Egyptian, Greek, Roman, Romanesque, and Gothic architects all felt the want of color and used it, and although color had perhaps better not be suggested by an architect until he is quite sure that he will be employed, it seems to be a subject for serious cousideration.

It is of the greatest importance to have the description of a proposition as brief as possible, but covering all the points. A resumè of the specifications is of great benefit

*Paper read at the 38th Annual Convention, A. I. A., Washington, D. C.

THE IDEAL HOUSE.

Lecturing in Philadelphia, Dr. Robert Ellis Thompson described the city house of the future. He said it would contain no stoves. Cooking will be done by power, the building will be heated from a central plant, elevators will run from cellar to garret, and breakfast, lunch, and dinner will be supplied from a co-operative centre. The era of scientific cooking on the co-operative plan has been inaugurated in Bergen, [illegible] been banished from the home, and all receive their [illegible] from co-operative centre.

Not only will the house of the future be cleaned by power, but the dust will be removed by a pneumatic exhaust system. Streets will be cleaned in like manner, and the dust and dirt will be carried away into the country, so that country people may yet visit the cities for a breath of fresh air.

Hospital Nurse: "These new patent fire escapes are great blessings." Hospital Doctor: "Indeed they are. It is much easier to cure fractures than burns.

OUR HOMES TO WARM.

The man who strives, at the expense of his coal pile and peace of mind to maintain a temperature of 68 or 70 degrees in his home incurs a needless waste and endangers his health is the conclusion of Dr. Henry Mitchell Smith, a Brooklyn physician. Dr. Smith has spent years in the study and observation of the effect of an over-heated and over-dry indoor atmosphere upon the health, and has come to the conclusion that what is needed when the thermometer registers say, 65 degrees, is not more heat, but more moisture in the air. When it is taken into account that 25 per cent. of the cost of heating is expended in raising a temperature from 60 to 70 degrees, it will be seen that Dr. Smith has solved a great economic problem, as well as pointing a way to the preservation of health. A moment's thought recalls the fact that we often sit out of doors in the spring and summer with perfect comfort at a temperature that would cause us to shiver in our rooms in winter. These widely different conditions Dr. Smith attributes to the presence of humidity in the one instance and its absence in the other.

Dr. Smith has so repeatedly demonstrated the fact that an indoor temperature of 65 degrees is more balmy and agreeable than a much higher temperature, proyided there is sufficient humidity that, he declares, it should be a cardinal rule that if a room at 68 degrees is not warm enough for any healthy person it is because the relative humidity is too low, and in such a case the proper procedure is to raise the relative humidity not the temperature. He recommends that every household should have a hygrometer, or moisture indicator, and that water should be evaporated in rooms in sufficient amount to secure a relative humidity of about 60 per cent. In the absence of the hygrometer a simple test will be to evaporate a sufficient amount of moisture to make the room comfortable at 65 or 68 degrees.

One point emphasized by Dr. Smith is that every time we step out of our houses during the winter season we pass from an atmosphere with a relative humidity of about 30 per cent. into one with a relative humidity of, on an average, 70 per cent. "Such a sharp and violent contrast must be productive of harm, particularly to the delicate mucous membranes of the upper air passages."

The remedy is to maintain the indoor humidity at the proper point—between 60 and 70 per cent.

THE CAMPANILE, VENICE.

The committee entrusted with the superintendence of the work in connection with the re-erection of St. Mark's Campanile, says the correspondent of the *Glasgow Herald*, has published particulars of the progress made during the past year. The report states that, during 1904, 3076 trunks of larch trees, having an average diameter of eight inches and length of from 12 to 13 feet, have been driven into the ground around the old foundations, which have been thus strengthened sufficiently to bear a load of 16,000 tons and support a pressure of 4.82 tons to the square foot. Larch trees have been used in preference to oak, as their trunks are straighter. The spaces between these piles have been [illegible] solid and reliable base on which to raise the superstructure. This foundation has been further strengthened by placing above it a further row of piles laid lengthwise and covered with cement. Up to the present the total expenses connected with the work amount to 115,588 lire (or about 4623*l.*), 79,914 lire having been spent during 1904 and 36,674 lire in the preceding year. Still greater precautions are to be taken to ensure the stability of the new structure, and it is estimated that before the base is considered thoroughly reliable a sum approximating 8000*l.* will have been expended.

Messrs. Stewart & Langley, contractors, of Niagara Falls, Ont., recently constructed in twenty-eight days 471 cubic yards of 12 inch concrete walling for the new chemical works at Longford, Ont., of which Mr. E. D. Pitt, of Niagara Falls, is the architect. This may well be considered rapid work.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From Inquirer :— I would be pleased if you will kindly inform me if it is possible to veneer a house with cement blocks, similarly to veneered brick work, so that it would be satisfactory; and if so, would you kindly explain how the work should be done, also, how much cement, in pounds, should be used in one yard of sand, where it is intended to use one of cement, to five of sand?

Ans. :—You may veneer your house on exactly the same principles that brick veneering is done; that is tie the blocks well into the frame of the building, by using strong iron ties made of good wire and covered with tar before laying in wall. These ties must be well fastened into the woodwork at one end, and the other end should be laid flat in the mortar joint before the next course of blocks are laid. The cement blocks should not be less than five inches thick and from eight to ten inches wide and may be made from twelve to eighteen inches long. Window and door sills may be cast to suit the thickness of wall and width of openings, and window sills should not be less than four inches thick. Door sills made to such thickness as may suit situations. Lintels, should be made full thickness of walls, and should be arched a little on top, and rebated for top of window or door frame. The window and door jamb block should be also rebated, same as lintel, to accommodate window and door jambs. When the lintels are made segmental on top, the blocks resting on lintel must be made to fit the curve on top, so that all horizontal joints will run in straight lines. This matter may be easily adjusted, when laying out the openings. There must be a good solid stone or concrete foundation under the walls, in order to prevent settlement; for any movement in the foundation will cause the cement block to crack or show open joints. The foundation is an important factor in all veneered work, as well as in solid work. With regard to the proportion of cement to sand, one cubic yard of sand, contains 27 cubic feet and one cubic foot of cement weighs 90 lbs. very nearly; therefore, according to the proportions of the several materials you name, 90 pounds of cement will require 5 cubic feet of sand, or nearly 1/5 of a cubic yard. In accordance with this, therefore, a cubic yard of sand, will require 5 2/5 of cubic feet of cement or about 488 lbs. It must be borne in mind that Portland cement varies in weight per cubic foot, some of the finest cement weighing as much as 100 lbs. per cubic foot. A better method of proportioning cement is by actual measurement. It is easy to measure one pail-ful of [illegible] tion of sand is used. This latter method is the one usually employed by cement workers. One barrel of cement equals 3½ cubic feet. Ties should not be less than 6 feet apart and should be laid in every other course of blocks; or better still, in every course. They should not be laid directly over each other, but placed zig zag in the wall. Lime cement mortar should be used when laying the blocks, and the joint edges of the blocks should be wetted when being laid.

From Carpenter:—Will you please advise me as to a good method of constructing the framework for an ordinary double hung bay window for a frame building?

Ans.:—There are many ways of doing the work, nearly every builder having his own method, The one

Bay Window Angle.

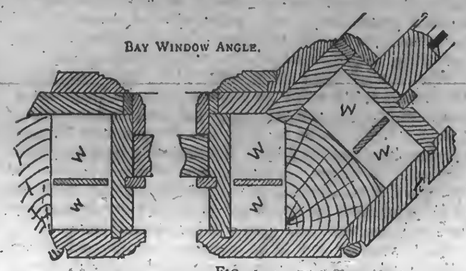


Fig. 1.

shown in Fig. 1 is a very good one and made use of by many good workmen. It is simple and uot costly. It shows a simple way of arranging jambs and stiles of frame, the stud forming a backing for both frames. The casings inside and out may be made to suit the taste of the builder. The boxes for the weights may be made of any reqnired size. Fig 2 shows how the sil

Bay Window Sill.

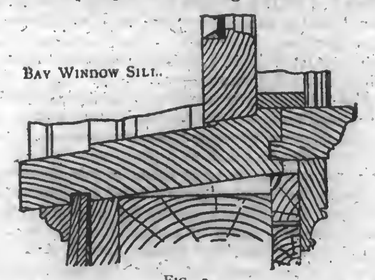


Fig. 2.

may be finished if desired. The head of the window may be finished in the ordinary manner. From these sketches and descriptions "Carpenter" should have no trouble in making his window frames and finishing the same in a satisfactory manner.

From young workman:—Kindly inform me as to a good method of laying out the lines for foundation walls.

Ans.:—To lay out the foundation for a building properly requires great care and usually considerable experience, for it is seldom that the novice will take sufficient time and pains to have his work accurate and so permanent that it will not be likely to be [illegible] fixed by the building of the walls. One frequently sees a foundation laid out without any more permanent posts or landmarks than a set of light stakes to which the mason's lines are secured. Such stakes will soon be leaning in every direction, and the proper placing of the lines will be impossible without going over the whole work as at the beginning. It must be remembered that the mason's lines will most likely have to be taken down and replaced several times before the foundations are complete, and one should be able to fix their location definitely at any time. A proper beginning is to fix on two lines at right angles to each other and mark them permanently as base lines, either upon other buildings or fences or by setting posts or stakes firmly in the ground with their tops level with the surface, a nail driven nearly down to the head indicating the exact position of the line on each stake. After this preliminary work is done it is a good plan to set stakes a little back from each corner, connecting them with strips of board upon which the exact position of the lines can be indicated by nails nearly driven down, upon which the mason's lines can be drown. This method has the advantage that, in squaring up, the lines can be shifted as required without disturbing the stakes. In getting the right angle it is convenient to make use of the steel square in setting the lines to their approximate places, checking the work by measuring very accurately 6 feet on one line, and 8 feet on the other, when the distance between these two points, diagonally across the corner would be exactly 10 feet. By measuring each line and squaring two or more corners, the accuracy of the work can be proven. This latter method of verifying the correctness of the work, is based on a well known geometrical solution, and is known among workmen as the 6, 8 and 10 rule.

From country contractor :—I have three sets of sliding doors to arrange and put up, and. as I know but little about this kind of work, I should be thankful to you if you will publish a few pointers on the subject.

Ans.:—Replying to this querist, we submit the following which has been handed to us by an expert on hanging sliding doors.

"In preparing for sliding doors, about the first thing which is very important to attend to is to see to having a firm and level floor directly under such openings, and this necessitates carefully planning and executing the foundation work.

Chalk line for your 2 rows of studs, being careful to select only straight sized studs, and let me say here that it is not absolutely essential that the 'heading timber' be just 4 inches wide, as shown in some hanger details; anything from 3¼ to 4 inches will be all right for ordinary doors. Sized studs in the hard pine States are 1⅝x3⅝ and in my practice I commonly spike 2 select studs together for the 'spreader'. The only thing about this header or spreader which must be 'just so' is that it must be level, whether the floor be or not, and must be the proper distance above the floor, which will depend entirely on what hanger you use, plus the length of the door and ½ inch under the doors. The simplest and most perfect hanger in my estimation is the "Wilcox Trolley Ball Bearing House Door Hanger," when such can be obtained. The wood header furnished with this hanger may be screwed or spiked to the header before spiking the latter in place, and the [illegible] or otherwise finished. This makes it possible to adjust both ends of track with very little trouble.

Double sliding doors of course require 2 complete frames with jambs of a width to allow ⅜ or ½ inch on either side the door, which will be mostly concealed in finishing with the stops.

Most hardware will necessitate the stops being "scooped out" a little where the escutcheons or pulls pass through.

A double frame should be in width equal to the 2 doors and astragals counting from the back or stud side of the jambs. I prefer matched astragals and plain face locks. The 2 frames should be set perfectly plumb and even at all points.

Lining pockets and matching or spicing the overhead jambs as shown in some details are "mostly moonshine."

The simplest and most lasting 'bumper' is a piece of metal say about ½x1x3 inches fastened with a long, slim lag screw about lock high at the back edge of each door; if the hole for the lag screw be drilled a little to one side of the center the device will have a tendency to hang down and across the door if left a trifle loose, and may be turned long way up and down the door with a thin instrument at any time that you may want to remove the door. If the hanger you use is not supplied with this form of bumper, our blacksmith will make them for a few cents each. It is scarcely necessary with most hangers to have bumpers at the back end of pockets, but if one is found necessary after the pocket is finished the simple thing is to bore a hole in the back edge of door, and drive in a 'long pin'—snfficently long to bump against the first thing bumpable. Single sliding doors need one solid jamb."

DAMAGES FOR NON-COMPLETION OF CONTRACT.

By A Barrister.

If the contract is not completed, it may be that nothing is payable by the employer; but assuming that something is payable, either by reason of the employer's acceptance of the incomplete performance, or because he has prevented the employé from completely performing, the question arises how the payment or damage is to be computed. The standard applicable depends upon whose default it is that the contract is not completed. If a contractor fails to perform his contract, the employer has a right against him for breach of contract, even although he may have paid the price, unless there has been a final acceptance by approval of the architect. Such damages may be made the subject of set-off or counter-claim, according to their extent. It may therefore be that while the employer is not bound to pay anything, either because the work is useless, or because, owing to non-completion, the contractor has no right of action for the price, the contractor may be sued by the employer for damages resulting from such breach of contract. But this question is more usually raised when there is an acceptance of the partly performed contract, or an acceptance of delivery with reservation of all claims. In such a case the damages are set off against the claim for the price. When the employer has refused to accept, he [illegible] only [illegible] the contractor for the [illegible] but may also recover damages.

In matters of contract the damages to which a party is liable for its breach ought to be in proportion to the benefit he is to receive from its performance. Now this benefit, the consideration for his promise, is always measured by the primary and intrinsic worth of the thing to be given for it, not by the ultimate profit which the party receiving it hopes to make when he has got it. The leading case on the subject of damages is that

of Hadley *v* Baxendale (9 Ex. 341). The plaintiff's were owners of a steam-mill. The shaft was broken and they gave it to the defendant (a carrier) to take to an engineer to serve as a model for a new one. On making the contract, the defendant's clerk was informed that the mill was stopped and that the shaft must be sent immediately. He delayed its delivery, the shaft was kept back in consequence, and in an action for breach of contract they claimed as specific damages the loss of profits while the mill was kept idle. It was held that if the carrier had been aware that a loss of profits would result from a delay on his part, he would have been answerable. But as it did not appear he knew that the want of the shaft was the only thing which was keeping the mill idle, he could not be made responsible to such an extent. The court said: "Where two parties have made a contract which one of them has broken, the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally—*i.e.*, according to the usual course of things from such breach of contract itself—or such as may reasonably be supposed to have been in the contemplation of both parties at the time they made the contract, as the probable result of the breach of it. Now, if the special circumstances under which the contract was actually made were communicated by the plaintiffs to the defendant, and thus known to both parties, the damages resulting from the breach of such a contract which they would reasonably contemplate would be the amount of injury which would ordinarily follow from a breach under these special circumstances so known and communicated. But, on the other hand, if these special circumstances were wholly unknown to the party breaking the contract, he at the most could only be supposed to have had in his contemplation the amount of injury which would arise generally, and in the great multitude of cases not affected by any special circumstances from such a breach of contract. For, had the special circumstances been known, the parties might have specially provided for the breach of contract by special terms as to the damages in that case, and of this advantage it would be very unjust to deprive them. The above principles are those by which we think the jury ought to be guided in estimating the damages arising out of any breach of contract."

In another case the defendant had contracted to build a ship which was to be delivered to the plaintiff on Aug. 1. It was not delivered till March in the following year. The vessel was intended by the plaintiffs—and from the nature of her fittings the defendants must have known the facts—for a passenger ship in the Australian trade. Evidence was given that freights to Australia were very high in July, August, and September, but fell in October, and continued low till May, when the vessel sailed; and that had she been delivered on the day named she could have earned £2,750 more than she did. On the other hand, it was shown that the plaintiffs would have extended the time for delivery till Oct. 1 if the defendants would have bound themselves to that day under a demurrage (which, however, was refused), and that they had stated as their reason for wishing to have the ship then, "that after that time the days would [illegible] and prejudiced in fitting the vessel out." The jury found a verdict for £2,750. An attempt was made to set aside the verdict for excess of damages on the ground that if the plaintiffs' offer had been complied with, the loss of freight would have been suffered; and that the damages should be measured rather by the species of loss which they had themselves pointed out, than by that which they afterwards set up. The rule was refused. In this case the primary object of the ship was to earn freight by carrying passengers. The defendant was to be paid the value of such a ship. Any delay in its completion would clearly subject it to a diminution in value by a fall of freight. The measure of that diminution was the difference in profits obtained on the first voyage.

Any increased cost to which a person is put from the necessity of doing himself what he had contracted that someone else should do for him is recoverable, if what he does is the fair and proper thing to do under the circumstances. Not only cost, but inconvenience caused by a breach of contract, may be paid for by damages, provided the inconvenience is substantial and appreciable.

Damages which would not arise in the usual course of things from a breach of contract, but which do arise from circumstances peculiar to the special case, are not recoverable unless the special circumstances are known to the person who has broken the contract. In one case the plaintiff had undertaken to repair a steam threshing machine for a third person by harvest time. For this purpose he required a new fire-box. The defendant undertook to make him one in a fortnight, but the plaintiff did not tell him of his own contract to repair the threshing machine. The defendant made default in delivering the fire-box, and the plaintiff in consequence was unable to perform his contract, and was sued by the owner of the threshing machine and obliged to pay him compensation. This compensation he sought to recover from the defendant, but failed, because it could not have been in the contemplation of the defendant when he made his contract with the plaintiff, and was not the ordinary consequence of the breach.

In another case the defendants had built a large floating boom derrick, fitted with machinery, for raising sunken vessels, for a company which had become insolvent, and had left it on their hands. The plaintiffs agreed to buy the hull of the derrick, which the defendants were to empty of machinery, and deliver it at a time fixed. The plaintiffs, who were coal merchants, intended to place in the hull hydraulic cranes for the purpose of transhipping their coals direct from colliers into barges. The purpose was entirely novel and unknown to the defendants. They believed that the plaintiffs intended to use the hull for a coal stores, which was the most obvious use to which such a vessel was capable of being applied by persons in the coal trade; but the derrick, being an entirely novel and exceptional vessel, and the first of the kind built, no vessel of the sort had ever been applied to such a purpose. She was capable, however, of being profitably employed for that purpose, and had she been so employed, her non-delivery at the time fixed would have caused loss and damage to the plaintiffs to the amount of £420. As it was, the plaintiffs experienced a much greater loss, for they had purchased machinery and steam tugs to be used in conjunction with the hull, and these lay idle for a considerable time. The plaintiffs, therefore, lost the interest upon the moneys expended, and also the profits which they would have made by the use of the derrick. The chief contention was as to whether the defendants were liable to pay the £420. The court held that the sellers, having contemplated that the derrick was to be employed in what was, in fact, the most obvious mode of earning money, and the plaintiffs having lost more money than they would have lost if they had so employed it, they were entitled to be compensated to that extent, the loss having been the natural consequence of the non-delivery of the derrick. —Contract Journal.

A reliable authority gives the following table of the [illegible] foot for different kinds of roofing materials:

Asphalt and composition	½
Tin	[illegible]
Corrugated iron	3
Sheet iron	3
Copper	2
Lead	2
Thatch	6
Shingles	4
Slate	4
Tiles, Terra-cotta	4

MONTREAL NOTES.

With a very considerable amount of building in progress and in view, and with nothing serious threatening in the nature of strikes amongst the workmen, the prospects for the building season continue to be of the best. One of the largest schemes on foot promises to be that in connection with the Windsor hotel, the directors of which announced their intention last March of spending about one and a half million dollars in the erection of an Annex to their hotel on the site of the Windsor Hall.

The Windsor Hall in spite of certain accoustical deficiencies, is so essential to the well being of the community that its loss would be a severe one. We understand however that there is good prospect of another hall being presently erected in the same neighborhood to supply its place.

A good augury in the architectural field in Montreal appears in the establishment of a junior architectural club, and the P.Q.A.A. is to be congratulated on having set it on foot. The juniors start off with praiseworthy enthusiasm and an excellent constitution. The somewhat formal existence of the older society leaves plenty of field for activity on the part of the younger.

At the annual exhibition of pictures in the Art Gallery, open from March 12th to April 8th this year, the number of architectural drawings exhibited was very meagre, representing only eight exhibitors; and on the whole the representations did scant justice to the works they portray. Thus the view of the Branch of the Royal Bank at Westmount is far from giving a pleasing suggestion of this really fine building, and the same might be said of the drawing of the branch office of the Bank of Montreal by the same architects, Messrs. Edward & W. S. Maxwell, at Westmount. Their drawings of the exterior and interior of the C.P.R. station building at Winnipeg similarly fail to inspire one with admiration for the design, though leaving room to hope that the actual building will not be similarly wanting.

As is frequently the case in exhibitions of this kind, a number of drawings are spoiled as representations of architecture by the introduction of spottings of unnecessarily juicy color. This applies to a very nice little brick house by J. Rawson Gardiner, as well as to two houses shown by McVicar & Heriot. In the same way the key-note of the "New Sherbrooke," by the same authors, seems to be given by the red-hot motor car at the door; the architecture trying to look similarly up-to-date. Another of Messrs. McVicar & Heriot buildings, the Mussen Building, of a simple and rational design, looks vastly more pleasing in black and white. A preliminary study for the McGill Students Union stands distinguished as a piece of conscientious draughtmanship. The design is dignified and refined—perhaps a trifle too frigidly confined to a simple outline. One would like to see it swerve a little more to suit the presumably not too severe necessities of its human occupants.

George A. Ross, A.R.I.B.A., sends a measured drawing of the little Trianon at Versailles, which shows that he can take architecture seriously and treat it with respect. A number of designs by Clarence Luce exhibit a large ambition in compositions of an academic character.

If one considers how projects of public importance in Montreal have been managed in cases that have lately been much in prominence, one can hardly feel surprised if in architectural matters one finds few indications of large minded civic enterprise.

Some time ago one read day after day in the newspapers about the new Harbour Sheds till one became giddy with trying to make out whether they were actually to be of one storey or of two. Another question, of somewhat minor importance comme[illegible] was that of the Mountain Outlook. The [illegible] announced more than a year ago, for a new wooden outlook, to replace the existing primitive and inoffensive shelter on a more [illegible] About [illegible] carried out when some wiseacres, on a tour of self exhibition, affected to see in the rather [illegible] something quite too atrocious for their sensitive artistic feelings. As there was no [illegible] coming from the little innocent, its ruin was forthwith decreed and forthwith it disappeared—the only purpose it had served in the meantime being to absorb a considerable sum of money. After these exhilarating proceedings the Parks and Ferries Committee tried to become quite serious, they obtained designs for a more substantial and permanent arrangement. When these designs were matured and estimates called, the soaring ambition of the promoters found itself unable to face the expense, and went back to the City Council to ask advice on the matter. Now in proceedings of this kind, and more important instances must be of continual occurrence, it would seem not too impracticable to have a definite and useful if unofficial relationship between the city's representatives and the Association of Architects. For instance if the individuals among the aldermen who take a real pride and interest in the the improvement of the city's appearance—there are some such—could be brought to discuss questions of civic amenity before the Association they ought to be well received. In case they had good projects which they would fain see carried out; they should find themselves in a congenial atmosphere in which their ideas could take root and develope. Their hands could be strengthened by the opinions of a variety of men whose business it is to judge of the benefit of schemes of the kind. They would be placing these matters in a field where a wider range of discussion would fill and round out their initial ideas; and it is to be hoped that, in some cases, they would find these ideas improved upon or even superseded by others which, under the present circumstances, are unlikely to occur to individuals working in comparative isolation.

CONCORDIA SALUS.

REAL ESTATE IN MONTREAL.

From the large amount of sales of real estate recorded during the month of March and the enquiries for residential and business properties it is safe to say that the market continues to be active, and the business for the first four months of this year is likely to show up better than it has done during the same period for many years.

Medium-priced dwelling houses in good localities for occupation this spring or in the early fall are readily sold and more readily rented. Even the high priced houses are finding purchasers, and the demand for all kinds of residential properties is pretty sure to lead to active building operations during the ensuing season.

The suburban sections can hardly fail to benefit from the insufficient supply of house accommodation in the city. Westmount particularly has attracted the attention this spring of a good many enquirers, and is likely to continue to do so.

Business properties have also been purchased freely in certain established sections, not so much for investment or speculation as with the object of meeting actual business requirements. The recent sales on St. Catherine street have rather stiffened the prices of properties on some of the side streets.

The demand for rentable space in buildings and factories still keeps up, but hardly to the extent that it does for dwelling house accommodation, but neither is the prespective supply of business space as large as the condition of the demand calls for excepting as regards offices, the supply of which appear to be sufficient for present needs.

On the whole the real estate situation in Montreal is a healthy one, but it is more satisfactory to the property owner than to the tenant, and building operations will have to be much more active than they are now to cause a surplus of house and business premises. Generally speaking, new houses are built more to sell than to rent and the prospects for selling are good. When a man has had his rent increased two or three times he is usually in a proper frame of mind to buy a home of his own.

One hundred and forty-four building permits were issued in March, and the stated aggregate cost of the work is $489,680. This includes 81 permits for new buildings, consisting of 66 houses, 135 tenements, 2 stores, 1 warehouse, 3 factories, 1 educational building and 14 sheds, to cost in all $370,450. There were also 63 permits for alterations or repairs to 56 houses, 50 tenements, 31 stores, 2 factories, 1 hospital 1 hotel, 1 stable and 6 sheds, amounting to $119,230.

The sales recorded during the month of March in the undermentioned suburban municipalities amount to $705,554, and are as follows:—Maisonneuve, $12,725; Delorimier, $9,280; Town of St. Louis, $73,174; Petite Cote, $2,709; Outremont, $4,482; Cote des Neiges, $5,526; Notre Dame de Grace, $800; Montreal West, $[illegible]; St. Henry, $580,034; and Ste. Cunegonde, $6,100. The exceptional sale of [illegible] includes a transfer from the Colonial Bleaching & Printing Co., Ltd., to the Dominion Textile Co., Ltd., the consideration being $507,000.

There were 288 real estate transfers in the city wards and [illegible] month of March, amounting to $1,118,358.

During the corresponding month of last year 223 transfers were recorded, amounting to $1,069,348.

—Lovell & Cockshutt Simpson Real Estate Record.

Amid all the shouting we hear of the gospel of success, much of which will not bear examination, there are a couple of wholesome maxims from our exchanges:—

The talent of success is nothing more than doing what you can do well; and doing whatever you do without a thought of fame.

To do great things, a man must live as if he had never to die.

MASTER PLUMBERS ASSOCIATION OF ONTARIO.

The annual convention of the Association held at Guelph on Good Friday is considered to have been the most successful from the standpoint of a large attendance and sustained interest of any within the history of the organization. The fact of the meeting having been called on a public holiday when cheap railway fares were available, doubtless contributed to this result.

Among those present were: Chas. C. Cote, Niagara Falls; A. Stoner, Strathroy; F. Smith, Stratford; S. P. Gourlay, St. Catharines; W. H. Johns, Southampton; J. W. P. Huffman, Port Hope; Daniel Kerr, Sarnia; Geo. A. Caldwell, Buffalo, N.Y.; Lew J. Avery, Seneca Falls, N.Y.; Peter Shields, Kincardine; Oscar Zyrd, Hespeler; Charles Taylor, Brantford; L. H. Wilson, Frank P. Turner, Pittsburgh, Pa.; Thos. Phillips, Norman Phillips, Orillia; Geo. H. Lang; J. H. Neelands, Barrie; Jas. E. Scott, Foster Cook, Wm. Cadman, St. Thomas; John McKinley, H. A. Knox, Wilfred Knox, Ottawa; Peter Hipnmen, P. Isies, H. Wolfhard, H. L. Hymmen, Berlin; Thos. A. Norris, F. Lockhart, Hy. Dakin, James Scott, Benj. F. Bennett, A. J. Howes, Galt; John A. McLean, G. L. Needham, James R. Haslett, E. H. Russell, T. L. Partridge, Benj. Noble, O. F. Robb, W. J. Green, Wm. Young, London; W. D. Smith, H. W. Morley, G. C. Elliott, W. B. Malcolm, J. H. Wilson, R. W. Hamilton, A. M. Bond, Arthur Sommerville, W. G. Harris, R. Rodgers, W. J. Walsh, S. Melton, W. J. Clark, T. H. Davies, J. F. Bartlett, Hamilton; E. M. Passmore, W. A. Mahoney, W. J. Stevenson, Adam Taylor, John Yule, John Strachan, Morris Wills, Jas. J. Taylor, J. M. Struthers, E. B. Welsby, R. Mahoney, Fred Smith, A. Malcolm, Chas. Kelly, C. E. Richer, J. P. Hockin, Guelph; J. R. Foster, E. J. Brewer, W. J. Sheppard, E. Larter, J. I. Hanlan, D. J. Morgan, C. H. Beavis, E. B. Fewing, P. McMichael, Robt. Ross, W. H. Meredith, Wm. Mansell, A. McMichael, H. W. Anthes, Fred Armstrong, G. A. McDonald, W. E. Pickard, J. G. Fullerton, W. B. Inwood, K. J. Allison, Geo. H. Cooper, Lewis Le Grow, E. A. James, Harry Hogarth, Toronto.

The delegates from all parts of the Province were extended a civic welcome by Ald. J. M. Struthers, while the Taylor Forbes Co., Guelph Foundry Co., the Page Mersey Co., and the local manufacturing concerns co-operated with the local plumbers in making the visit enjoyable.

A conference was held between the members of the Association and representatives of the supply houses touching matters affecting the trade. The opinion has been expressed by some members of the Executive that [illegible] are the meetings of the Association proper, thereby leaving no room for the suspicion that there is anything [illegible] are stated to be such as will bear the fullest investigation.

One of the most important results of the convention was the appointment of a Committee to draft a uniform Sanitary By-law to be submitted for adoption to all cities and towns in the province operating sewerage systems. The Toronto Plumbing Ordinance as amended March, 1896, will probably form the basis for the new measure, but an effort will be made to improve upon this ordinance, which in some important particulars is felt to be defective, and unfair to plumbers. It is contended that all plumbers should not only be licensed but placed under bonds to make good any defects in their work. If this were done, it is urged that the plumbers snould be given entire charge of the construction of the plumbing and drainage system both inside and outside the building as far as the street connections. In Toronto the plumber is held responsible for any leak which may develope in the drains notwithstanding that these are often put in by unskilled labor and are outside the plumbers' contract.

The Committee charged with the preparation of this proposed uniform Sanitary By-law is composed as follows:—Messrs. F. Armstrong, L. LeGrow, G. H. Cooper and J. H. Wilson, Toronto; B. Noble, Lonbon; H. A. Knox, Ottawa; W. Stephenson, Guelph.

Delegates were appointed to the convention of the National Association, which will be held in Atlanta, Ga., in June, as follows: F. Armstrong, Toronto; W. J. Walsh, Hamilton.

Messrs. John McKinley, Ottawa, and B. Noble, London, were appointed delegates to attend the meeting of the National Association of Steam Fitters, at Atlantic City, N.J., in June.

The following officers were elected for the ensuing year:

Past President—W. Mansell, Toronto.
President—W. J. Walsh, Hamilton.
Vice-President—H. Mahoney, Guelph.
Financial Secretary—T. H. Davies, Hamilton.
Secretary—W. H. Meredith, Toronto.
Treasurer—J. H. Wilson, Toronto.

Executive Committee—Messrs. E. H. Russell, London; H. A. Knox, Ottawa; A. Riddel, St. Catharines.

A very enjoyable dinner at the Wellington Hotel brought the convention to a close. Mr. Mahoney ably fulfilled the duties of Chairman and toastmaster.

In addition to the usual patriotic toasts, the following were honored:—"The Architects," proposed by R. Harriston, responded to by Mr. W. A. Mahoney. "Manufacturers and Supplymen," by. F. Armstrong; responded to by Messrs. J. M. Taylor, C. L. Dunar and C. Near. "Sister Associations," proposed by Mr. W. Stevenson; responded to by Messrs. W. Walsh, E. Russell and E. F. P. Brain. "The Press" and "The Ladies."

A FEW HIGH STRUCTURES.

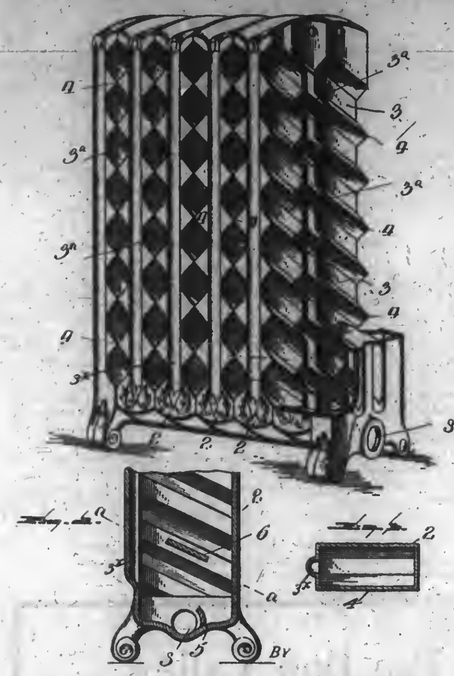
The tallest structure in the world to-day is the Eiffel tower, built for exhibition purposes at the Paris Exposition, with a height of 984 feet. Of enduring structures, the Washington monument stands at the head with its 555 feet of solid masonry.

The famous Cologne Cathedral comes next. It is [illegible]

Next in rank, Egypt's great pyramid at Ghizah, the wonder of all ages, stands a monument to the art of ancient builders. Though the beautiful slabs of white marble, which in the time of the Pharaohs lined its sides, have been stolen, and its tombs have been discovered and stripped, the great monument stands as solid and high as ever. It is claimed that evidence has been discovered that this pyramid was constructed by Noah, builder of the Ark. The pyramid is 485 feet high.

THE LEEK RADIATOR.

Walter Leek, heating engineer, of Vancouver, has patented a steam radiator designed to increase the amount of radiation per square foot of surface by decreasing the length of the air travel. Radiation of heat from steam being due to its condensation and the liberation of latent heat, the value of radiating surface depends upon its condensing power; in other words, upon the difference between the temperature of the steam and the air in contact with the radiator. And, to get the maximum of radiation, the coolest air in the room should keep coming to the radiator, and should pass away from it as soon as it is warmed. The usual vertical-loop radiator keeps warmed air in contact with most of its surface, because of the length of the air-travel. The Leek radiator gets over this by making the travel horizontal.



The steam enters at S, and, under the combined influence of the canted corrugations of the loops (3x) and a baffle (5) at the bottom, moves upwards by way of the furrows (3x) on the outside which is therefore the hottest part of the radiator; and the water of condensation returns down the incline of the corrugations towards the back which is therefore the coolest part. The air, in consequence of the inclination upwards and outwards of the spaces (3a) between the corrugations, will travel from back to front, meeting increasing heat as it grows increasingly warm. It is claimed therefore by the inventor that there is an active circulation of air through this radiator, and, if the warmed air, as he says, is cast towards the centre of the room the supply should be the cold air passing down the walls and there should be a maximum of radiation.

G. T. KNIGHT & SON
Manufacturers of
Building Supplies
we make a specialty of
Doors and Sashes; Mouldings and all kinds of turned goods.
Address, MEAFORD, ONT.

The Color Question "Settled"
RICKETSON'S MINERAL COLORS
Strongest Made. Stood the Test for 18 Years. Never Fade.
The Universal Exposition, St. Louis, 1904, Gave Us the Highest Award. Can We Add More?
Red, Brown, Buff, Purple and Black
For Clay, Cement, Brick, Building Blocks, Mortar, etc.
Ricketson Mineral Paint Works
MILWAUKEE, WIS.

The RICHMONDT CONDUIT & MFG. CO., Limited
Sole Manufacturers of
Richmondt Electro-Galvanized and Navallte Condult Tubing, and Fittings
For Absolute Safety in Interior Wiring.

Factory and Office: 15, 17 and 19 Jarvis St., Toronto, Canada

Neponset
Waterproof Papers
For over twenty-five years the standard of the U. S. Government, the leading architects and builders in the States and now adopted by architects and builders in Canada.
PAROID ROOFING
A permanent ready roofing for any building where a good roof is desired. It is especially adapted to porches and places where shingles cannot be used to advantage. It wears longer and costs less than shingles. Send for our sample book.
F. W. BIRD & SON, MAKERS
HAMILTON, ONT.

The Queen City Plate Glass and Mirror Co., Limited
243, 245 & 247 Victoria Street, TORONTO, ONT.
EXTENSIVE DEALERS IN
Glass and all other Glass required for Buildings, also Glaziers' Points
MANUFACTURERS OF
Plate and Ornamental Chipped Glass, Sand-Cut Glass and Art Lead Work, British, German and Sheet Mirror Plate.
BEVELLERS. MIRROR MAKERS.

THE - BEST - YET
FOR
HOUSE OR BARN
FACTORY, FOUNDRY
WAREHOUSE
Proof against
Water, Steam, Fumes, Acid, Alkali, Gas and Vermin.
Air Tight and Odorless
—FIRE RESISTING—
Will Not Melt or Run
Practically Indestructible
WRITE FOR PRICES
THE YOKES HARDWARE CO., LIMITED 111 and 113 YONGE STREET, TORONTO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited

Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITORIAL ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	S. G. CURRY,	,,
2ND VICE-PRESIDENT	W. A. LANGTON,	,,
TREASURER	HENRY SIMPSON,	,,
REGISTRAR	W. R. GREGG, 96 King St.,	Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	,,
J. WILSON GRAY	,,
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD, Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal.
2ND VICE-PRESIDENT	R. P. LEMAY, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. R. BROWN.

P.Q.A.A. COUNCIL.

JOS. VENNE	Montreal.
H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. B. RESTINE	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.	T. MARTIN.
JOHN MALONEY, 2nd Vice-President.	R. G. KIRBY.
	GEO. GANDER.

Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE.

HENRY STRATFOLD, President.	J. JONES.
JAS. S. LONEY, 2nd Vice-President.	JNO. WHITTAKER.
GEO. S. GOULD, Secretary-Treasurer, 471 English St.	L. H. MARTYN.
	A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.	C. P. SHINDLER
R. A. CARTER, Secretary.	K. M. FRASER.
H.A. BELL, Treasurer.	E. G. BAINES
T. BRADBERY.	D SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President. T.D. ROBINSON, Treasurer.
G BUROEAULT, 2nd Vice-President. ALEX. MUIR IRWIN, Sergeant-at-Arms.
Directors: T. G. Latimer, E. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girolu.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.	JOHN DUTHIE
EDWARD M. ROBERTS, Vice-President.	P. LAHER
G. J. SHEPPARD, Secretary-Treasurer.	JOSEPH LAMBERT, Jr.
J. H. HUTCHISON.	JAMES H. MAHER.

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)

8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, Jr., and Vice-President.	H. CONTANT.
ALCIDE CHAUS B. Treasurer.	E. A. COTE
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

THE CELEBRATED NEPONSET WATERPROOF PAPERS AND PAROID ROOFING TO BE MADE IN CANADA.

F. W. Bird & Son, East Walpole, Mass., for nearly a century makers of special papers and felts and known all over the world by their Neponset Waterproof Papers and Paroid Roofing, are erecting a factory in Hamilton and have just opened a branch office at that place. This will enable us to obtain these standard articles at regular prices. A very neat sample book has just been put out by this concern and any architect or builder may have it for the asking. Address F. W. Bird & Son, Hamilton, Ont.

The large works of the International Portland Cement Co., at Hull, Que., started operations last week and are now turning out a high grade of cement in large quantities.

The Don Valley Brick Works

are now manufacturing

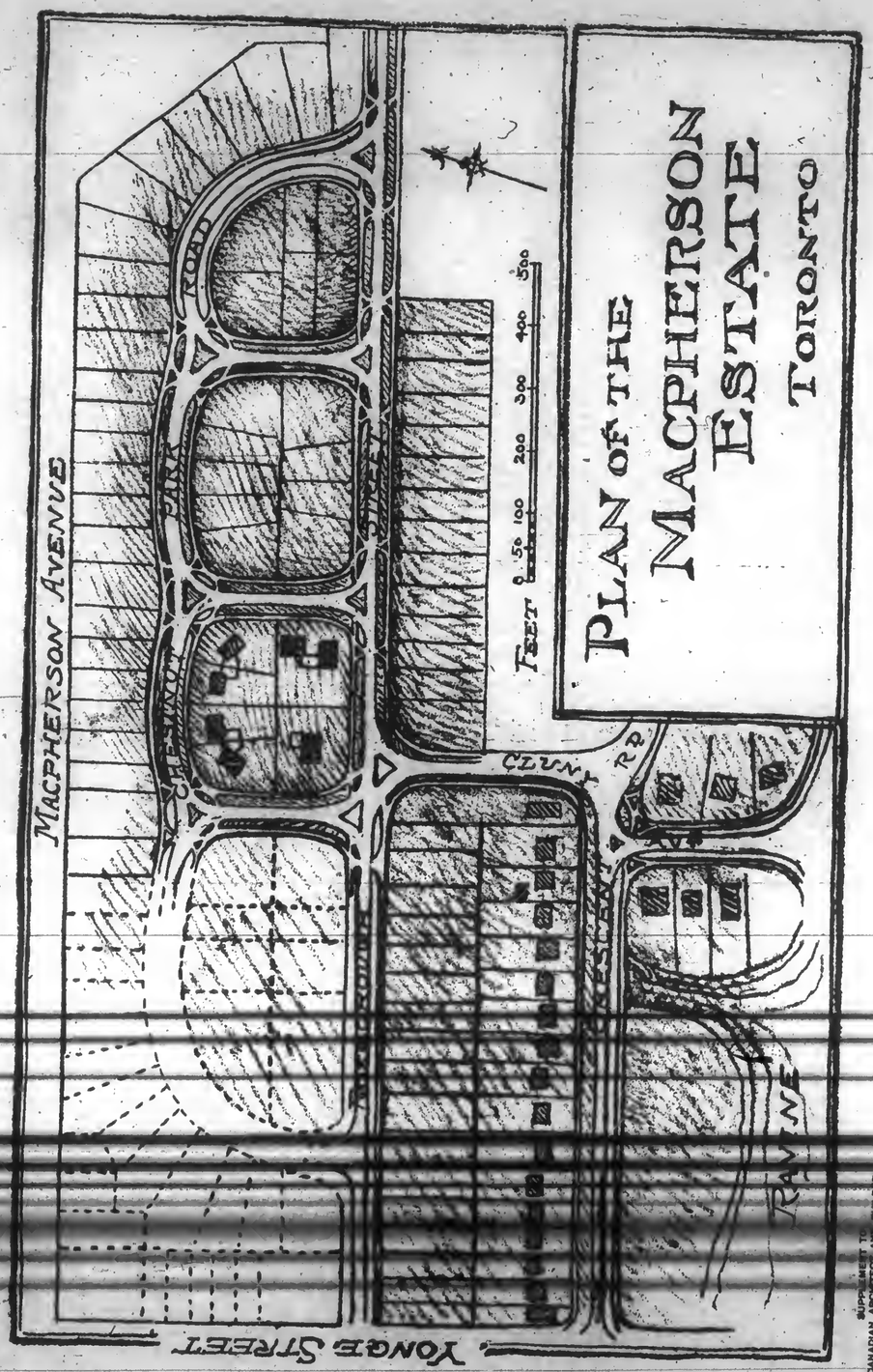
POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

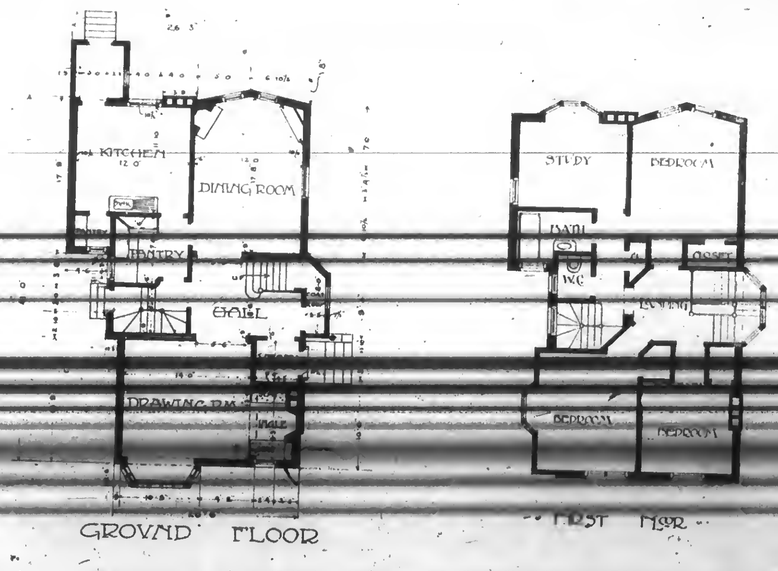
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices


PLAN OF THE
MACPHERSON
ESTATE
TORONTO
MACPHERSON AVENUE
CRESCENT
ROAD
STREET
CLUNY RD.
RAVINE
YONGE STREET
FEET 0 50 100 200 300 400 500
SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER APRIL 1913

VIEW FROM NORTH-WEST.



GROUND FLOOR — FIRST FLOOR

HOUSE OF J. W. SIDDALL, ARCHITECT, ROXBOROUGH ST., TORONTO.

HOUSE IN VICTORIA, B.C.

S. MACLURE, ARCHITECT.

COTTAGE IN VICTORIA, B. C.
S. MACLURE, ARCHITECT.

ST. MARY'S CHURCH, PORTAGE LA PRAIRIE.
H. S. GRIFFITHS, ARCHITECT, WINNIPEG.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1905

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 209. MAY, 1905.

ILLUSTRATIONS ON SHEETS.

No. 17 Elm Avenue, Toronto—Messrs. Chadwick & Beckett, Architects.
View of Front.
View of Ingle.
Ground Floor Plan.
First Floor Plan.
Church of St. Peter and St. Paul, Fall River, Mass.—Messrs. Cram, Goodhue & Ferguson, Architects.
Concrete House of Mr. Charles A. Matcham, Allentown, Pa.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Mr. Kivas Tully, I. S. O., Late Architect to the Province of Ontario.
Side Door of Verona Cathedral.

CONTENTS

Editorial Notes	65-66	British Columbia Plumbers Organize	78
Central Heating	67	The Royal Canadian Academy Exhibition	78
Mr. Kivas Tully	68	Colonial Contracts	79
Humidity in Heated Houses	68	The Devil's Door	79
Our Illustrations	69	American Radiator Company in Canada	79
Mr. Joseph McCausland	70	Architecture at the S. P. S.	80
Major Henry A. Gray	70	Skyscrapers in Germany	ix
Review	70	Floated a Brick House Down the Allegheny River	x
Some Notes on a Flying Trip to Washington, Baltimore and Philadelphia	71-72	Making Bricks Without Clay	x
		A Swede's Impression of America	xi
Measurements and Prices; Their Relation to the Master Painter	73	Why Brick Construction is Costly	xii
		The Lewis and Clark Exposition	xiii
Intercommunication	74-75-76	The Hamilton Convention	xiv
Montreal Junior Architectural Association	77	Making Tar Paper at Sault Ste. Marie	xiv
Montreal Builders' Exchange	77	Restriction of Working Hours Unconstitutional	xv
Building in Montreal	77		

OUR VANCOUVER OFFICE.

The publishers of this journal have recently established an office in Vancouver for the purpose of looking after more carefully the interests of subscribers and advertisers in British Columbia. This office is located at 536 Hastings Street, Suite 3, opposite Molson's Bank, and is in charge of Mr. G. A. Gall, who will be pleased to meet any of the friends of this journal, and to serve their interests in any possible way.

Atelier at Columbia University.

The School of Architecture at Columbia University is adopting the French method of instruction, as an addition to its course. Two architects of distinction—Mr. C. F. McKim and Mr. Thomas Hastings—have been appointed as professors to conduct an atelier for the study of architectural problems.

Statuary Marble in Hastings Co.

The Princess of Wales, when she visited Canada in 1901, was given some specimens of stones which had been got and polished by the Dominion geologist. It occurred to her, after returning to England, that a Canadian industry ought to arise where there were such stones. Eventually it [illegible] to pick out the facts from the gush of an interview—a Scotch geologist, who was struck by a specimen of white marble, appears to have come out and found a hill of statuary marble. There is also sodolito (a decorative blue stone) and green and white building marbles. The ground is all bought with English money, and the purchasers promise to establish quarries for the building market. Their idea is to compete with the Belgian market, for which purpose, since labor is cheap in Belgium, they must expect to produce cheaply, and perhaps Ontario will find an opportunity for beautification at small cost with her own material.

The Reduction of Niagara

The *Times*, in a special article by William G. Unwin, F.R.S., on the subject of the Niagara water power, makes calculations which indicate that this generation is likely to see the water going over the Falls reduced to little more than half what it might be. The total utilization of power now projected amounts to 650,000 h.p. The *Times* correspondent says, "The whole of the machinery for this development may not be erected for some time, but that great confidence is felt that it will be required may be inferred from the fact that very costly head works, wheel pits and tail races are being constructed for the full projected amount of power." In view of this prospect Mr. Unwin makes the following calculations: "The mean flow of the Niagara river is about 222,000 cubic feet per second. Suppose, what is about true, that 150,000 h.p. are now daily utilized, that the [illegible] available fall is 160 [illegible] and that the efficiency of the turbines is 0.75. Then the daily demand for water is 11,011 cubic feet per second, which is 5 per cent. of the mean flow, or 6¾ per cent. of the *minimum* flow. But if 650,000 h.p. are utilized the demand for water will be 47,740 cubic feet per second, or 21½ per cent. of the mean flow and 30 per cent. of the minimum flow. Obviously, if no alteration of the falls is at present perceptible,

the alteration is likely in the future to be very considerable, especially as the depth of water over the American fall is very small." But this is not all. As is pointed out in an article on the "Destruction of Niagara Falls," by Mr. A. D. Adams, in *Cassier's Magazine* for March (quoted by the *Times* correspondent), the canals are also a source of deprivation for Niagara Falls. The Chicago drainage canal and the Welland canal drain away a large quantity of water that would otherwise go over the Falls. And other canals are projected. Mr. Adams expects the total diversion of water to reach before long 67,400 cubic feet per second, and that will be 41 per cent. of the *minimum* flow of the Niagara river.

Site for the Convocation Hall, University of Toronto

Whatever one may feel about the loss of beauty at Niagara by the abstraction of water for power purposes, there is a substantial advantage gained to the country, and, in view of the absence of smoke implied, it may even be said that beauty is served on the whole. But in the case of the ground in front of the University building the loss, if it is curtailed, will be all loss. It is not a good site for the Convocation Hall, which would be much better situated on either of the residential lots belonging to the University, which lie on College street on each side of the new building for the School of Practical Science. There the street cars would be in close connection and the building, which is not particularly in harmony with the University, would be an ornament to the street. The objection to this course, or indeed to almost any other site than that proposed, is want of money. So much money has been collected, so much is given by the Government and more is wanted merely to complete the building. A site that costs money is therefore out of the question as far as the trustees are concerned, and that is the end of the matter with them. But is it necessarily the end of the matter: There is always money for what is considered to be worth money. If the Government, if the public, cared much about the matter, the money would be forthcoming. It has always been understood that there would be no residence buildings for the University because the Government had declared that no public money would go for this purpose. But opinion grows in the direction of residences. Four are declared necessary. A private benefactor gives enough for one. A committee is formed to collect the rest, and inside of a week there is $200,000 available. It is never money that is wanting so much as a conviction that it should be spent. The question, as regards the cost of a site for the Convocation Hall, is really this: Is the University lawn worth preserving in its present extent? We have there without doubt one of the finest buildings in America and one of the finest sites. Is it worth while to preserve it

be admitted that, as the plan of the grounds in the architect's office shows the situation, it is not absolutely fatal. A line drawn about twenty feet to the north of the Medical Building (which will be the north line of the proposed Convocation Hall) still leaves the greater part of the space, and the main building has still a noble site. But what guarantee is there that the encroachment will stop there—if, indeed, we can trust the Convocation Hall to keep within this limit in execution. There is already talk of making it larger, and, when the road in front of the new building is cut from the green of the lawn, the apparent area of the space will be reduced more than it is easy to imagine at present. There ought certainly to be some limit fixed now, beyond which there will be no further reduction. If the decision is clear that the Convocation Hall should not be placed there, the money to place it elsewhere ought not to be impossible. This is a matter of public concern. The trustees of the University funds, whose only duty is to make both ends meet, are not in a position of wide enough responsibility to have the continued existence of this gift from a previous generation left to their decisions from time to time. It would be fair for the Alumni Association if it raises the money to settle the immediate question to appeal to the Government to settle the question for the future.

Ownership of Architectural Drawings

An American architectural journal wants to know why an architect should insist on his ownership of the drawings. "If," it says, "he keeps them for future use, to pick shreds and bits from them for use elsewhere, he is doing himself an injury. If he succeeds in that, all spontaneity is gone from his practice; he becomes a copyist and, worst of all, of himself." A man must base his design upon something in architecture. What he ought to base it upon is the total result of experience in his own mind. To look only on good types, excluding the ignorant imitator and supposing our architect to have truly a trained mind, there are still two types of mind—what has been called by a writer in the *Saturday Review* the "scrap-book mind," which keeps its information as it got it and can produce it again the same; and the "crucible mind," into which whatever enters undergoes a change, disappearing and often forgotten as a fact and coming out as part of a product. To the first class is most likely to belong the accomplished designer, who has the styles at his fingers' ends and can work correctly and even acceptably in all. Old drawings are of less use to him no doubt than to the other type. He draws upon his well-stocked mind for every fresh effort and always finds his material there because he always uses the same material. This is readiness, but it cannot be called spontaneity. The truly spontaneous designer is the man with a crucible mind. Everything he receives undergoes a change and becomes to that extent an original product. Even his own results are submitted again to the crucible process. His mind is always [illegible] revising and extending them in his mind, and when it comes to drawing a new design, old drawings are the natural starting point. It is this spirit rather [illegible] polished designer, that leaves its mark upon the architecture of its time, either as leading or as assisting in its development. It is this that makes the work that future generations will look upon as having character and marking a period. Its designer is the true architect; the very man in fact to whom drawings are not an end but an instrument of service, and, if they are useful to him, he ought to have them.

CENTRAL HEATING.

If a general inclination towards an improvement is an indication of its near approach, central heating is not far away. Not far away, that is, for ordinary application. In special cases of grouped buildings and for parts of towns there are already numerous plants in the United States extending from a mile or so of pipe to over fifteen miles and the supply of some 500 houses.

The advantages of central heating in the way of doing away with discomforts are obvious. There will be no coal to be brought in, no ashes to be taken out, no dangerous boiler, no man to mishandle it, no dirt, no noise, no filling up the cellar with stuff that makes the parts that are free unfit for their uses. But the advantages are not only negative. Connection with a well ordered system implies heat in the doubtful days of early winter and early spring, without consideration of the policy of "starting the furnace" or "letting the furnace out." It means full heat at any hour of the day or night. It means also, if steam is the means of heating, that water for baths and household purposes may be heated from the central station. And a due humidity of air by the emission of steam could be (perhaps has been) regulated by an automatic contrivance.

As to cost—there is in the first place a saving for the consumer in boiler installation, attendance, costly coal, and perhaps fire insurance, all of which is to be reckoned as an offset to the cost of heating from a centre. And, on the side of cost, there is but one item—a great one, the street mains—which is not an actual economy for the community in the way of reduced waste of natural resources; and this economy must find its bearing upon the consumer in the end. With operations on a large scale, the cheapest kind of fuel is used, and the cost of handling it is likely to be kept down by placing the station with regard to easy supply. There is a saving in the cost of attendance, for, when the boilers needed for a district are combined in one plant, few hands comparatively are needed to operate them. And the skilful operation of coupled boilers can make savings which cannot be got out of single boilers, which have to be adapted to the coldest weather and half the time are not working economically. There must also be a saving to the community in the reduction which central heating stations would make in the aggregate cost of boiler insurance.

The great economy, however, which is to be effected by the introduction of central heating is the utilization of exhaust steam. The use of steam for the production of power means the generation of nearly ten times as many heat units as can be converted to mechanical energy. That is to say, nearly 90 per cent. of the steam generated is discharged from the exhaust pipe. Railway and lighting companies throw away in this manner heat which, if it were applied, would soon pay for the first cost of laying street mains by means of which to use it and make it profitable.

It follows that the economical application of central heating is in combination with the production of light and power. Whatever may be the doubt about the safety as an investment of a central heating plant which stands alone, there seems to be no doubt whatever that as a by-product, utilizing steam heat that would otherwise be wasted, it is a safe "proposition."

The more comprehensive the combination the better. Power and heat or lighting and heat are each better than power alone or lighting alone; but the combination of power and lighting and heat in one station is better still. All concentration for one thing, reduces personal attendance, and it increases the opportunity of using economizers and superheaters which are more applicable to large and steady running plants than to small plants which run unevenly. But there is another and a large field of economy opened up by the manner in which the separate functions of a combination play into each other's hands. There will often, for instance, be a coincidence in the periods of high requirements of power or lighting (and therefore of much generation of steam) and the periods when heat is especially wanted. Thus the season of maximum light requirement is also the season for heat supply; and the heavy morning demands for heat correspond with the "peak-load" periods of an electric railway.

The question as to the form of heating seemed to be rather in favor of steam before the issue recently by Mr. Bernard Green, superintendent of the Library of Congress, assisted by Prof. S. Homer Woodbridge, of a report upon a central station for power and heating for the thirteen existing and projected Government buildings on the Mall and in the vicinity of the White House. This report charges heavily in favour of hot water.

The choice of system depends rather upon the preponderance of advantage than the absence of disadvantage in either system. Both have objections which must be met, and the American District Steam Company, of Lockport, N.Y., who have put in a large number of plants, claim (in a pamphlet printed four years ago) to have met some of the principal objections to steam which are stated in the report of Messrs. Green and Woodbridge. These objections are in the way of difficult maintenance due to expansion strains, corrosive, condensation, etc. These it is possible for ingenuity to meet. The objection to hot water is the water itself, and it is difficult to get over the pressure of water raised to a height, the force of its expansion when freezing, and its determination to leak if it can and to find its way downstairs without making any noise about it. These objections are of less importance in public buildings which are in the charge of skilled attendants night and day. And for residences heated by an individual plant these are objections of less importance than the difficulty of managing steam without a skilled attendant, and the danger of mismanagement. But when the boiler is not in the householder's hands the balance of advantage to him seems to be in favour of steam.

Apart, however, from the care of having a destructive agent like water continually racing through the house within confining walls from which a pinhole would constitute a means of escape, the case for hot water, in the report of Messrs. Green and Woodbridge, is very strong.

They propose to drive water through the pipes

with centrifugal pumps at such a speed that the water, which will be sent out at a temperature of 150 degrees will only lose 30 degrees in the course of its circuit. With a temperature thus varying little and a pressure nearly constant, there will be little strain in the pipes; and, if the system is reasonably tight and the same body of water is continuously used, there should be no corrosion. The system should last and the heating promises to be equable.

MR. KIVAS TULLY.

Mr. Kivas Tully, late architect to the Government of the Province of Ontario, died on April 24th last in the 86th year of his age. Mr. Tully was an Irishman, the son of an officer in the Royal Navy, Commander John P. Tully. He was born in 1820 in Queen's county, and studied his professions (he was architect, surveyor and engineer) in Limerick. He was at first engaged in Limerick under Wilkinson, in the erection of public buildings, but in 1844, at the age of 24, came to Toronto and opened an office. He continued to reside in Toronto for the remainder of his life, but his work, in the days of his private practice, extended to the other towns of the province. He built the Town Hall of St. Catharines, the Anglican Church at Thorold, Victoria Hall and S. Peter's Church at Cobourg, besides houses in these and other places. In Toronto the old Custom House, the old Bank of Montreal, and the old Western Assurance Building, were his work, and, while still in private practice, he built for the Government the wings of the Lunatic Asylum. His most conspicuous piece of work, however, was Trinity College, Toronto. The front, with a short residential wing, was all that was completed of the original design, which is shown in a perspective drawing which still exists, as extending to about the same length on the west side as on the front, and equally ornate. The intention was to ultimately enclose a quadrangle. The requisite amount of building has in fact been accomplished in the course of time, but the different efforts have not been connected, and the building is now in the form of an E. The perspective drawing shows a chapel with a spire, situated apart, to the south-east of the building, but clear of the facade. There is also shown a stone retaining wall for the terrace, the absence of which in execution was always a source of regret to Mr. Tully. Its cost at the time of building would have been only £500.

When the Government of the Province of Ontario was constructed, just before Confederation, Mr. Tully was appointed architect and engineer. The offices were afterwards separated and Mr. Tully became architect, which position he filled until 1896, his 76th year. He then retired, but remained in the service of the Province, as consulting architect, until his death.

Some of the principal provincial buildings carried out under his direction were: The Central Prison, Toronto; Asylums in London, Hamilton, Brockville and Mimico; Institutes for the Deaf and Dumb at Brantford and Belleville; the Mercer Institute, Toronto.

Mr. Tully's work was not limited by his duties as Provincial architect. He was also, from the year 1852 until his death, engineer to the Board of Harbour Commissioners, and all works done in Toronto harbour by the commissioners were done under his direction.

He was frequently consulted on other matters. He was associated with Mr. McAlpine in 1887 in a report on the drainage of the City of Toronto; with Captain Eades in a report on the preservation of Toronto harbour; with Captain Eades again in a report on the proposed Toronto and Georgian Bay Ship Railway. He had previously made the requisite surveys for a proposed Georgian Bay Ship Canal, and an interesting model, made by him, of the portion of the Province through which the canal would have passed, has been exhibited in the Toronto Public Library.

Mr. Tully held high rank as a Freemason, and at his funeral, which was of a public character, the Masonic order took charge of the service at St. James' Cemetery.

He was one of the charter members of the Canadian Institute. In his earlier days he took part in municipal affairs in Toronto as School Trustee, Councilman and Alderman. In 1894 he was a delegate to the Deep Waterways Commission.

In recognition of public services Mr. Tully, in 1903, received the Imperial Service Order from the King.

Mrs. Tully, who was a daughter of Lt.-Col. Strickland, of Lakefield, died in 1883. There are two surviving daughters, Miss Louise Beresford Tully and Miss Sidney Strickland Tully.

HUMIDITY IN HEATED HOUSES.

Humidity in heated houses has been the subject of observations during the past year by Prof. R. C. Carpenter, of Cornell University, Ithaca, N. Y. The observations were made in his residence, which is heated by direct steam radiation, according to the Engineering News. He found that the humidity of the air in the house during the first half of the present winter ranged from 18 per cent. to 35 per cent., averaging, perhaps, close to 25 per cent. The humidity of the outside air during the same period ranged from 60 to 80 per cent., averaging about 70 per cent. As Prof. Carpenter says, the observations show that the air in his house is extremely dry, probably drier than that in most deserts. These results are identical with results of similar observations made by Dr. H. M. Smith, of New York City, some years ago and reported in a paper read before the Brooklyn Medical Society. Dr. Smith found that in an ordinary heated house the humidity through the winter of 1902 to 1903 was 24 to 30 per cent., while in the same period the average humidity of the outside air was about 73 per cent. He also made an experiment by keeping two adjoining rooms in a different moisture condition; one being at the normal heated house humidity, while the other by artificial moistening had its humidity maintained at about 60 per cent., which Dr. Smith calls "proper degree of humidity." The [illegible] maintained at a slightly lower temperature, 68 degrees Fahrenheit, than the dry room, which was kept heated to 72 degrees Fahrenheit, its humidity being about 30 per cent. By getting [illegible] temperatures or degrees of comfort of the two rooms from various visitors who were told nothing of the experiment, Dr. Smith found that the room with greater moisture was estimated to be at least 2 degrees warmer than the dry room. He concluded from his experiments that with a proper degree of moisture, say 60 per cent., a room temperature of 65 degrees Fahrenheit is comfortable. 68 degrees is warm and 70 degrees is rather too warm. With rooms as dry as heated houses ordinarily are in winter a temperature of 72 to 73 degrees Fahrenheit is none too warm, and even this always leaves the impression of drafts of air.

OUR ILLUSTRATIONS.

PORTRAIT OF THE LATE MR. KIVAS TULLY, ARCHITECT TO THE PROVINCE OF ONTARIO.

NO. 17 ELM AVENUE, TORONTO—MESSRS. CHADWICK & BECKETT, ARCHITECTS.

This house faces north and has its rooms, which seek the sun, and the conservatory and verandah on the inner side of the lot. The front towards the north and the street is, on the other hand, not expansive but decidedly reserved. Although there is a good deal of light the windows are so grouped that there is a considerable breadth of wall. The projection of the oriel from the brick wall, with its solid support of brick, its invisible roof, and the neighbourhood of the plain chimney, is a study in the preservation of breadth. The interpenetration of wall and window surfaces, where the chimney crosses the mullioned windows of the attic, is interesting also. It has a refining effect, analogous to the landscape painter's device of letting a white rabbit run into his mass of shadow, followed by a dog in the sunshine, thus weaving the two masses together and keeping breadth from becoming crudeness.

CONCRETE HOUSE FOR MR. CHARLES A. MATCHAM.

Mr. Matcham, manager of the Lehigh Portland Cement Co., has built for himself a concrete house which has outside dimensions of 58 ft. by 55 ft., including the porch and verandahs. The walls are 15 in. thick for the first foot and 13 in. from that point to the roof. The composition of the concrete was one part cement, four parts sand and seven parts stone. The windows and door frames were set as the concrete work progressed. The hall floors, 16 x 35 and 8 x 15 ft. are of concrete and expanded metal; the floor is 5 in. thick laid on 12 in. by 17 ft. beams, set 8 ft. apart. These concrete floors were finished off with cement and tile bordering. Both roofs and floors of the porches and verandahs are of concrete and expanded metal. The roofs have a span of 12 ft.

The expanded metal was of 2-in. mesh, ⅛-in. thick. It was laid on the boards set to hold the concrete. To the expanded metal were fastened some small channels 1 in. deep and 2 ft. apart. The concrete was tamped into the meshes and around the channels and made 4 in. thick.

The walls and arches are reinforced with iron rods, the walls having ¼-in. rods set vertically and horizontally about 18 in. apart; and over the windows and porch openings ¼-in. rods are laid in the concrete.

The columns and urns were cast in concrete in [illegible] and finished on with the house.

The finishing process consisted in giving the rough concrete, as it was left when the framing was removed, a coat for the sake of smoothness and color. Mr. Matcham, as a result of his experience, recommends a coat composed of one part cement, one part lime, and five or six parts of white or yellow sand. When a reasonably wet concrete is used, Mr. Matcham thinks such a house might be plastered on the solid wall. A dry concrete would be less trustworthy.

As to the cost of construction the following account is given: "There were 400 cu. yd. of concrete in the walls and floors of the house, and taking into consideration the carpenter work, setting up framing, setting doors and window frames, and joists as the work progressed, the common labor, cement, sand and stone, totaled up to $2,600, which would make the concrete cost $6.50 per yard. Ordinary brick houses, with pressed brick face, cost from $10 to $12 per cubic yard.

In considering the cubic yards of concrete in this house, the hall and porch floors and roofs are figured in. If these had been figured separately, the main walls of the house would cost less per cubic yard, and, of course, the floors and roofs more, and it must further be taken into consideration no further carpentering was needed for roofing or flooring or slaters or painters, as would be necessary for a brick building. The cost of repairs to such a house are also brought down to a minimum.

The following material was used to a cubic yard of concrete: 320 lb. of cement, 950 lb. of sand, 2,560 lb. of crushed stone, 290 lb. of water; total, 4,120 lb. The proportions were about one part cement, three parts sand and eight parts stone."

SIDE DOOR, VERONA CATHEDRAL.

The thing which at once attracts the eye in this entrance is the combination of brick and marble. Verona marble is slightly red and takes the edge off the contrast with red bricks. Time, however, does this for other marbles. In Italy the combination of brick and marble is usually irregular and seldom complete. It stops suddenly at half height without apparent reason, or it occurs only partially in a building. Here there is intentional irregularity evident in the courses on the right, where the brickwork alternates three and four courses. Sometimes there is a regular number of courses of brick between marble courses of varying height; as if pieces of marble of equal height had been assembled to make a course. Marble can be banded throughout a building without there being too much of it, as is evidenced by the cathedral of Siena, which is finished in the interior throughout with bands of ivory white and dark green marble, and is one of the most impressive interiors in Italy. But the indeterminateness of the colour banding on the exteriors—rather like the uncertain definition of the markings of animals—is always a source of interest. The most striking point, however, in this illustration is the way in which the doorway has been made a feature in scale with the building by the application of a portal by means of which a 9-ft. doorway becomes a 30-ft. entrance.

CHURCH OF ST. PETER AND ST. PAUL, FALL RIVER, MASS. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS.

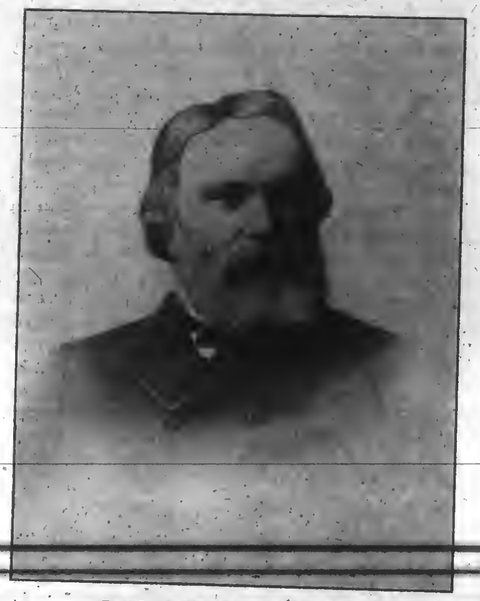
This is an interesting piece of Renaissance detail [illegible] Gothic for church work. The style, founded on that of the spacious times of Queen Elizabeth, is much more congruous with American life than either a mediæval style or a rigid following of the Roman orders. It is a wonder that the architects of the United States have not been attracted by the freedom of the English Renaissance which, in the hands of the present generation of architects, has more

vitality and freedom than before the Gothic revival, and in its application to new problems, is used with better taste than the French Renaissance is used in France.

MR. JOSEPH McCAUSLAND.

Mr. Joseph McCausland—who was born on February 10th, 1828 and died on May 3rd, 1905—was a north of Ireland man by birth, but came to Toronto as a child, 7 years old, and lived in Toronto for 70 years. At 18 years, nearly 60 years ago, he had founded the business which still bears his name, and for 55 years or more was actively engaged in carrying it on. The other side of his life, which was apparent to other people, was of the same steady character. He was for 60 years a member of the same Methodist congregation and prominent in its works.

The capacity to carry on business successfully is too often associated in our minds with rapacious qualities, which sometimes excite admiration by their energy but of which we cannot at the bottom of our minds approve. It is satisfactory therefore to be able to record that Mr. McCausland's distinguishing characteristics, in the ripe age to which he had attained when the



The Late Mr. Joseph McCausland.

present generation of architects were accustomed to meet him [illegible]

The [illegible] business, founded by Mr. McCausland is continued by his second son, Mr. Frank McCausland. The eldest son, Mr. Robert McCausland, was specially trained to conduct the stained glass department, and has established a very [illegible] business of this kind under his own name.

Mr. McCausland left four other children, all resident in Toronto : the Rev. Harold McCausland, who is a clergyman of the Church of England, and three daughters, Mrs. Boyce Thompson, Mrs. Charles Parsons and Mrs. J. Albert Sutcliffe.

MAJOR HENRY A. GRAY.

Major Gray's death in his 62nd year was due to over-exposure while on a recent visit of inspection of the Dominion Government power concessions at Fort Frances. Pneumonia developed, and he died about two weeks afterwards, on May 23rd, at his residence in Toronto.

The Late Major Henry A. Gray.

Although distinctively an engineer and, for the last twenty seven years, occupying a conspicuous position in that profession, as engineer in charge of the public works of Canada, Major Gray has also contributed some important works to the architecture of the country. His principal work of this kind was in Nova Scotia—a college at Memramcook and a large Gothic church at Truro. He was a Roman Catholic and was consulted in the erection of several convents and churches.

REVIEW.

Properties of Steel Sections. By John C. Sample, New York, McGraw Publishing Company. Price $3.00, net. The purpose of this book is to supply for built structural steel members the same kind of information that is given by the hand books and tables of the rolling mills companies for simple members. The tables were originally designed by the author for his own use as designer for a structural steel plant. Finding them useful he extended them to cover the ordinary members used by engineers and architects. It has not been considered to be within the scope of the work to treat the subjects involved from a theoretical standpoint. Only sufficient text is presented to explain the application of the tables. [illegible] the preface : "All values have been calculated and checked independently, and may be relied upon as correct." The book fills a space in technical literature [illegible]

BUILDING TRADES DEMANDS IN OTTAWA.

Building operations in Ottawa may suffer a severe setback this spring unless the differences between the building trades unions and their employers, the contractors, are speedily settled. The Bricklayers' Union have made demand on the secretary of the Contractors' Association for an increase of ten cents per hour from 42 to 52 cents. To this demand the contractors will offer an increase of three cents, or 45 cents per hour. The stonemasons have also demanded higher wages.

SOME NOTES ON A FLYING TRIP TO WASHINGTON, BALTIMORE AND PHILADELPHIA.

By Edmund Burke.

Washington.

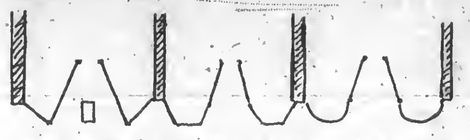
From the prosaic narrow streets of Toronto to the broad avenues of Washington, with their interesting perspectives and vistas is as great a change, artistically speaking, as was the change from a wintry spring to the mildness of early summer with blossoming trees and shrubs, and flower-decked gardens and squares.

Going, fresh from the study of Toronto's plan, with which the O. A. A. Committee is now wrestling, I was doubly interested in the much-lauded plan of Washington.

I was, first of all, struck by the great scale on which the avenues and squares are laid out, the area devoted to each being greater in proportion than that of any other city in the world.

The Capitol, of course, dominates the city and the principal avennes radiate fan-shape from it as a centre. Most of the streets are laid out at right angles with the Capitol, the result being numerous acute angled intersections with the avenues—possibly too many—but as most of the buildings are kept well back from the street line, but few narrow, wedge-shaped structures are seen.

The very wide sidewalks in the business sections, with an apparent reservation on which only bay windows, shop fronts and steps are permitted to encroach, has resulted in a curious competition in the show windows of the stores, resulting in the greatest imaginable hodge-podge, which is not altogether architectural in effect. Here are some of the treatments.

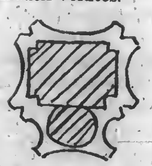


The business and house architecture of the city is with a few exceptions commonplace and uninteresting. The "H. H. Richardson" house will always be interesting, and there are a few of the newer houses, old colonial in feeling, which are decidedly good, so good that one wants to go back or pass that way whenever possible, as they seem to "grow" on one.

The numerous circles at the intersections of the avenues give fine opportunity for monuments, and [illegible] our city fathers could be transported to Washington for a week, under proper tutelage, we would find the project of improving Toronto streets much more popular than it [illegible]

They could also get pointers and precedent for a logical and simple method of naming and numbering our streets.

The Library of Congress is one of the most important and interesting structures in the city. Money has been lavished on it—something over $6,000,000—and while there is so much that is good one cannot help regretting that much that is not good has been permitted to creep into the design. While the mosaic work in the lower corridors is excellent in design and quiet in tone, the decoration of the ceiling of the main hall strikes one as crude and raw in the extreme. Many of the fresco paintings are charming in motive and execution, while on the other hand much of the modelling of the architectural ornament is commonplace and monotonous. It seems almost incredible that the enormous marble columns and pilasters in the reading room, over a score in number, should be crowned by Corinthian caps of identical design, cast in plaster apparently from the same mould, and commonplace in character. Moreover, these pilasters have so many re-entering angles, each with a compressed attempt at a cap, that the result is quite a jumble of partly hidden volutes.



It seems to me that here was a magnificent opportunity for the very highest type and invention in modelling, an opportunity which was taken advantage of in the Capitol. The same evidence of hurry and lack of thought and invention are visible in other portions of the building. In some places pilasters are cut in two or jammed into return walls for the sake of uniformity of spacing, resulting in deformed capitals and a general jumble of features which betokens either ignorance or lack of study.

The mistakes are all the more inexcusable from the fact that examples of a better way are to be seen in much of the work in the Capitol on the adjoining square.

While the interior of the Capitol looks somewhat dull and quaker-like after the brilliant newness of the Library, there is a character about its detail which is satisfying and pleasing to the eye of the architect.

The older buildings, such as the Capitol, the Treasury and the Patent Office, with their great single orders seem much grander and more dignified than the newer buildings with their superimposed orders. The State, War and Navy Building, with its four superimposed orders in the central features and three on the corner pavilions, is the least satisfactory of all, unless one includes the red brick Pension Building. The story is told in Washington that the designer of the latter building was showing it to General Sherman [illegible] exclaimed that it would do for a barn. The architect then went on to explain that it was fireproof, whereupon the outspoken soldier exclaimed, "What a pity."

Most of the other Government buildings, such as the Bureau of Engraving and Printing are devoid of architectural character.

The Corcoran Gallery of Art occupies a noble and well-designed building—by Ernest Flagg—and houses many notable pieces of sculpture, bronzes and paintings.

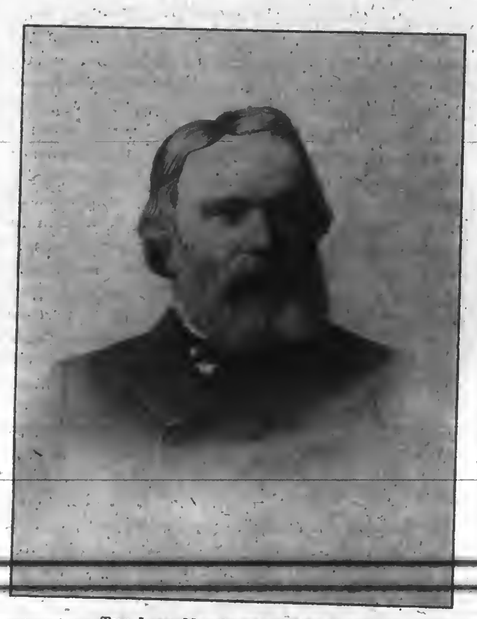
The Carnegie Library is also a well-designed building and well worthy a visit.

vitality and freedom than before the Gothic revival, and in its application to new problems, is used with better taste than the French Renaissance is used in France.

MR. JOSEPH McCAUSLAND.

Mr. Joseph McCausland—who was born on February 10th, 1828 and died on May 3rd, 1905—was a north of Ireland man by birth, but came to Toronto as a child, 7 years old, and lived in Toronto for 70 years. At 18 years, nearly 60 years ago, he had founded the business which still bears his name, and for 55 years or more was actively engaged in carrying it on. The other side of his life, which was apparent to other people, was of the same steady character. He was for 60 years a member of the same Methodist congregation and prominent in its works.

The capacity to carry on business successfully is too often associated in our minds with rapacious qualities, which sometimes excite admiration by their energy but of which we cannot at the bottom of our minds approve. It is satisfactory therefore to be able to record that Mr. McCausland's distinguishing characteristics, in the ripe age to which he had attained when the



The Late Mr. Joseph McCausland.

present generation of architects were accustomed to

The house-painting [illegible] business, founded by Mr. McCausland is continued by his second son, Mr. Frank McCausland. The eldest son, Mr. Robert [illegible], was specially trained to conduct the stained glass department, and has established a separate business of this kind under his own name.

Mr. McCausland left four other children, all resident in Toronto: the Rev. Harold McCausland, who is a clergyman of the Church of England, and three daughters, Mrs. Boyce Thompson, Mrs. Charles Parsons and Mrs. J. Albert Sutcliffe.

MAJOR HENRY A. GRAY.

Major Gray's death in his 62nd year was due to over-exposure while on a recent visit of inspection of the Dominion Government power concessions at Fort Frances. Pneumonia developed, and he died about two weeks afterwards, on May 23rd, at his residence in Toronto.

The Late Major Henry A. Gray.

Although distinctively an engineer and, for the last twenty seven years, occupying a conspicuous position in that profession, as engineer in charge of the public works of Canada, Major Gray has also contributed some important works to the architecture of the country. His principal work of this kind was in Nova Scotia—a college at Memramcook and a large Gothic church at Truro. He was a Roman Catholic and was consulted in the erection of several convents and churches.

REVIEW.

Properties of Steel Sections. By John C. Sample, New York, McGraw Publishing Company. Price $3.00, net. The purpose of this book is to supply for built structural steel members the same kind of information that is given by the hand books and tables of the rolling mills companies for simple members. The tables were originally designed by the author for his own use as designer for a structural steel plant. Finding them useful he extended them to cover the ordinary members used by engineers and architects. It has not been considered to be within the scope of the work to treat the subjects involved from a theoretical standpoint. Only sufficient text is presented to explain the [illegible] the preface: "All values have been calculated and checked independently, and may be relied upon as correct." The book fills a space in technical literature hitherto [illegible]

BUILDING TRADES DEMANDS IN OTTAWA.

Building operations in Ottawa may suffer a severe setback this spring unless the differences between the building trades unions and their employers, the contractors, are speedily settled. The Bricklayers' Union have made demand on the secretary of the Contractors' Association for an increase of ten cents per hour from 42 to 52 cents. To this demand the contractors will offer an increase of three cents, or 45 cents per hour. The stonemasons have also demanded higher wages.

SOME NOTES ON A FLYING TRIP TO WASHINGTON, BALTIMORE AND PHILADELPHIA.

By Edmund Burke.

Washington.

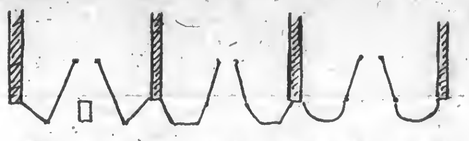
From the prosaic narrow streets of Toronto to the broad avenues of Washington, with their interesting perspectives and vistas is as great a change, artistically speaking, as was the change from a wintry spring to the mildness of early summer with blossoming trees and shrubs, and flower-decked gardens and squares.

Going, fresh from the study of Toronto's plan, with which the O. A. A. Committee is now wrestling, I was doubly interested in the much-lauded plan of Washington.

I was, first of all, struck by the great scale on which the avenues and squares are laid out, the area devoted to each being greater in proportion than that of any other city in the world.

The Capitol, of course, dominates the city and the principal avenues radiate fan-shape from it as a centre. Most of the streets are laid out at right angles with the Capitol, the result being numerous acute angled intersections with the avenues—possibly too many—but as most of the buildings are kept well back from the street line, but few narrow, wedge-shaped structures are seen.

The very wide sidewalks in the business sections, with an apparent reservation on which only bay windows, shop fronts and steps are permitted to encroach, has resulted in a curious competition in the show windows of the stores, resulting in the greatest imaginable hodge-podge, which is not altogether architectural in effect. Here are some of the treatments.



The business and house architecture of the city is with a few exceptions commonplace and uninteresting. The "H. H. Richardson" house will always be interesting, and there are a few of the newer houses, old colonial in feeling, which are decidedly good, so good that one wants to go back or pass that way whenever possible, as they seem to "grow" on one.

The numerous circles at the intersections of the avenues give fine opportunity for monuments, and [illegible] our city fathers could be transported to Washington for a week, under proper tutelage, we would find the proj[illegible] of improving Toronto streets much more popular than at present.

They could also get pointers and precedent for a logical and simple method of naming and numbering our streets.

The Library of Congress is one of the most important and interesting structures in the city. Money has been lavished on it—something over $6,000,000—and while there is so much that is good one cannot help regretting that much that is not good has been permitted to creep into the design. While the mosaic work in the lower corridors is excellent in design and quiet in tone, the decoration of the ceiling of the main hall strikes one as crude and raw in the extreme. Many of the fresco paintings are charming in motive and execution, while on the other hand much of the modelling of the architectural ornament is commonplace and monotonous. It seems almost incredible that the enormous marble columns and pilasters in the reading room, over a score in number, should be crowned by Corinthian caps of identical design, cast in plaster apparently from the same mould, and commonplace in character. Moreover, these pilasters have so many re-entering angles, each with a compressed attempt at a cap, that the result is quite a jumble of partly hidden volutes.

It seems to me that here was a magnificent opportunity for the very highest type and invention in modelling, an opportunity which was taken advantage of in the Capitol. The same evidence of hurry and lack of thought and invention are visible in other portions of the building. In some places pilasters are cut in two or jammed into return walls for the sake of uniformity of spacing, resulting in deformed capitals and a general jumble of features which betokens either ignorance or lack of study.

The mistakes are all the more inexcusable from the fact that examples of a better way are to be seen in much of the work in the Capitol on the adjoining square.

While the interior of the Capitol looks somewhat dull and quaker-like after the brilliant newness of the Library, there is a character about its detail which is satisfying and pleasing to the eye of the architect.

The older buildings, such as the Capitol, the Treasury and the Patent Office, with their great single orders seem much grander and more dignified than the newer buildings with their superimposed orders. The State, War and Navy Building, with its four superimposed orders in the central features and three on the corner pavilions, is the least satisfactory of all, unless one includes the red brick Pension Building. The story is told in Washington that the designer of the latter building was showing it to General Sherman [illegible] and stoutly exclaimed that it would do for a barn. The architect then went on to explain that it was fireproof, whereupon the outspoken soldier exclaimed, "What a pity."

Most of the other Government buildings, such as the Bureau of Engraving and Printing are devoid of architectural character.

The Corcoran Gallery of Art occupies a noble and well-designed building—by Ernest Flagg—and houses many notable pieces of sculpture, bronzes and paintings.

The Carnegie Library is also a well-designed building and well worthy a visit.

The Washington Monument impresses one on near approach chiefly by its size and simplicity, but as one journeys about the city and suburbs constantly catching glimpses of it, now through vistas of trees, now through haze or rain cloud, or again in brilliant sunshine silhouetted against a dark background, it grows in interest and impressiveness and becomes a thing of grace and elegance.

One of the most interesting studies for one who is archaeologically inclined is contained in a peculiar structure on New York avenue, designed and erected by Mr. Franklin Webster Smith. The front of the building is a reproduction of an Egyptian temple, while the interior contains what the author describes as "Ten Halls of the Ancients," consisting of full-size models of Egyptian halls, a Pompeian house a Roman taberna (or shop) a Moorish hall, a Saracenic hall, the Assyrian throne room of Sennacherib, and other halls and apartments. These halls are claimed to be faithful transcriptions of their ancient prototypes, both as to form, detail and color.

The author has a much more ambitious scheme, of which he exhibits a large model, being no less than a National Gallery for Washington which shall cover a very large site. The buildings are to be reconstructions of all the ancient styles of architecture chronologically arranged, with paintings illustrating the history and the arts of the nations, while other buildings for a Hall of Fame and galleries for American history and portraiture, presumably of modern design, would be incorporated in the group, all constituting a most complete and remarkable educational ensemble.

Mr. Smith is now an aged man, but most youthful in his ideas and feelings. He proposes to execute this gigantic scheme entirely in concrete, claiming great economy over the use of marble, stone and brick.

Mr. Smith claims to be the pioneer in the introduction of concrete in modern work, having instituted its use in the construction of the great hotels at St. Augustine, Florida, and was himself the architect of the Hotel Casa Monica and the Villa Zorayda in that city, which are built of that material.

Baltimore.

A hurried drive through the burnt district and a few of the residential streets, and a quick run through one of the new office and newspaper buildings left no time for a very close examination of the new structures replacing those destroyed by fire. Outside of a few high fireproof buildings, a majority of the new structures appeared to be ordinary four and five-story buildings, very commonplace in design and of ordinary joist construction, a few having the so-called mill floors. A large number have exposed steel girders and columns, and are apparently no better prepared to resist a conflagration than their predecessors. The streets in the business [illegible] than those in Toronto—in fact several important streets appeared to be no wider than Colborne street, a single street car line leaving barely room for one vehicle on each side, with sidewalks not more than six or seven feet in width. I understand that an appropriation of $2,000,000 has been made for new streets in the burned district and widening others, an opportunity which Toronto should have seized after last year's fire. An appropriation of $1,000,000 has also been made for parks and park extensions.

Philadelphia.

A more complete contrast to the generous avenues and streets of Washington than the Quaker City can scarcely be imagined.

The streets are almost entirely laid cut on the prosaic "gridiron" plan, practically only one artery, Ridge avenue, running in a diagonal direction. In consequence, if one wishes to reach a distant point in this vast city, lying in a diagonal direction from his starting point, he has to travel, probably, one-third farther to reach his destination than he would have to in Washington. The journey will moreover be further complicated by the fact that owing to the narrowness of the streets but one street car track is permitted on each street, travel being limited to one direction with the return line one or perhaps two blocks away. Philadelphia thus stands even more in need of diagonal arteries than Toronto, while the problem of transportation is analagous to our own. Philadelphia is moving in the matter, and among other improvements expropriations are being made for a broad diagonal avenue beginning at the City Hall square, and extending to Fairmount Park via Logan square, one of the four squares planned and located by Penn when laying out the city.

Broad (or 14th) street is the one really wide street, and is unincumbered by tracks, and therefore a pleasant street to travel upon, being free from the din and danger of the nerve-racking trolley, though invaded by an almost continuous procession of automobiles, cabs and carriages. The City Hall sits squarely across it at the intersection of Market street and thereby robs it of some of its value as a grand avenue, its bulk being so great as to separate and disjoint the street, making it practically two distinct avenues.

The city is so vast that but a fraction can be seen in a brief visit. The impression gained by a hurried traveller is that the bulk of the architecture is very commonplace and that most of the attempts, where large means were available, have been hideous failures. One has to hunt up and down street, back and forward, to find an occasional piece of good work. This work, by a thoughtful school of architects, is thoroughly good and characteristic.

Suburban work, if Pelham may be taken as a good example, is not equal to our own Rosedale.

"Sky scrapers" are more scattered than in New York and the streets are therefore not so canyon-like.

The number of steam railways crossing and re[illegible] by [illegible] above streets and alleys [illegible]

Enormous expense has been entailed in the construction of viaducts and tunnels to enable the great [illegible] lines to reach the heart of the city, and immense sums have been spent in the erection of terminal stations.

Like Washington, Philadelphia is a good example of a sensible method of street numbering, but as the streets running east and west are named after trees, men and places, more time is required in familiarizing oneself with its peculiarities and geography.

MEASUREMENTS AND PRICES: THEIR RELATION TO THE MASTER PAINTER.*

It is our proper conception of, and strict adherence to, the principles which govern our system of measurements and regulation of prices, which determine our fate in the business world, and mark us either for success or for failure.

"Measurements and Prices" is the business end of the painting trade. The method by which we sell the commodities we have to market—and let the master painter be ever so good a mechanic, and be able himself to display his genius through the work of his hands, or let him be so genial and affable with his customers that it is a perfect delight to do business with him, yet if he fails to see that his measurements are correct and his prices right, his business must surely terminate in failure.

Let us take up this subject then and discuss it in the order in which it appears in the opening of the paper, and deal first with the question of measurements.

That very many there are among so-called master painters who have a very hazy conception of how to measure a job there can be no doubt, for the results of their ignorance is evidenced in the jobs which they take at prices which are only one-half their value. Many there are who never draw a rule or a tape-line over a job, or have any other well ordered system of measuring—they guess that it will take so much time and so much material to perform the contract sought and base their price on that assumption. Others there are who know how to measure, but who, if hurried, get careless, and rather than take the time to measure correctly risk a price on a hasty guess, like a worthy member of our Association did once in figuring against me. When I called his attention to the glaring discrepancy between his price and mine, in painting the outside of a pair of large houses, he admitted to me that he measured them as he rode by on his bicycle and never thought it worth his while to get off. That sparing of fifteen minutes at that time cost him forty dollars.

The master painter should be as careful of his measurements as any other business man. There are two kinds of dishonest people in the business world. First, the man who starts out to rob his customer by charging him for value not given. Such a man is soon found out by his customer and his services are not required again. The second is the man who robs himself, his family and his creditors, by giving his customer more than he is paid for because of improper measurements. This man will soon be in the hands of the assignee and be a reproach to his family and friends.

What would you think of a dry goods merchant who, when asked and paid for one yard of cloth, would cut off one and one-half yards and give it at the price of one yard? Or what would you think of the grocer who, when asked and paid for a pound of goods, gave a pound and a-half for the same money? Such a procedure, if habitual, would bring disaster to the merchant. Will it not be equally disastrous to the master painter, if he is paid for covering one yard of work, and who through ignorance or mistake covers one yard and a-half or two yards for the price of one? Let us learn to be more careful and exact in our measurements, and the results will soon be seen in increased profits and better business.

I have thought that it might well come within the scope of this paper to suggest for your discussion a few rules, even though they are old ones, that might be helpful to us in measuring our jobs.

First, Outside Measurements. — Halls: Brick or wood, measure solid, adding in openings if not too large and cornices if plain. Where ladder or scaffold must be used, measure one yard per [illegible] as triple measurement.

Cornices, if dentilled, bracketted or panelled: Multiply the length by three or four times the girth, according to the judgment of the master painter.

Frames: Measure the height of the frame by from one and a half to three times the width of frame, according to the size of the glass in the window.

Doors: If panelled, multiply the height by from one and [illegible] panels.

Lattice fences: Double measurement, both sides.

Picket fences: One and one-half times measurement, each side.

Balustrades: Double measurement, each side.

[illegible] square to be covered.

Allow additional measurement, if the work to be done is unusually high or hazardous, or difficult to perform.

Inside Measurements.—Frames and doors: Same as outside measurement.

Base boards, plain and below 1 foot, to be measured as 1 foot; if more than 1 foot, and less than 2 feet, measured as 2 feet, etc.

Picture mouldings, etc., measure as 1 foot wide.

Dado: Where panelled, multiply by two or three times, according to panels and mouldings.

Walls, painted or tinted, measure solid, not allowing for openings (unless openings be extra large when allow one-half for them).

Cornices (containing three or four mouldings, and cove treated in different colors): Measure each separate moulding or cove as 1 foot girth; if only one color is used, measure twice its girth.

Cornices (dentilled or ornamental): Four or five times its girth.

Add extra always for stripping, preparing and sizing.

Papering.—It is not safe in cheaper grades of paper to figure more than seven yards to a single roll. On this basis measure thus:

Ceilings: Multiply the length by the width, and divide by 30.

Walls: Take girth the room, multiply by the height, and divide by 30; allow for openings.

For ingrains, or 30-inch papers, measure same as above, but divide by 60.

All stripping, sizing, etc., to be charged extra.

For night-work up to 12 o'clock, charge 1½ times regular price. For all night, twice regular price.

Now, this brings to me the second consideration of this paper, viz.:

Prices.—Now, after the contractor has satisfied himself that he has before him the correct quantities and measurements of the work to be done, his next important business is to be able to set a price to these measurements, which will not merely furnish the contract, but which will realize for him a reasonable profit, above all his expenses, commensurate with the size and quality of the job.

I think an examination of the following prices will make an interesting discussion for us. Of course, in this paper I can only deal with a few of these lines.

For making the comparisons which follow, I have before me three price lists.

The first is a tariff of prices adopted by the Master Painters' Association of Toronto in 1882 (23 years ago), when current rate of wages was 18½ cents per hour.

The second is a tariff of prices adopted by the Montreal Association of Master Painters in 1903, when the current rate of wages was 20 cents per hour.

The third is a tariff of prices adopted by the Toronto Association of Master Painters in 1902, when the current rate of wages was 30 cents per hour.

Remembering the difference in the rate of wages paid, and the added cost of conducting our business as compared with 1882, note the difference in the prices which now obtain. I will give you only a few examples:

Painting (common colors), per yard—

	Toronto, 1882, Tariff.	Montreal, 1903, Tariff.	Toronto, 1902, Tariff.
1 coat, 10c. per yard....	15c. per yard	10c. per yard	
2 coats, 17c. per yard...	25c. per yard	18c. per yard	
3 coats, 23c. per yard...	30c. per yard	25c. per yard	
4 coats, 28c. per yard...	40c. per yard	30c. per yard	

Brick Work—

1 coat, 10c. per yard....	15c. per yard	12c. per yard	
2 coats, 17c. per yard...	25c. per yard	18c. per yard	
3 coats, 23c. per yard...	35c. per yard	25c. per yard	

Blinds—

1 coat, $1.00 per pair..	18c. per ft. high	75c. per pair	
2 coats, 1.50 per pair..	30c. per ft. high	$1.25 per pair	
3 coats, 1.75 per pair..	40c. per ft. high	1.50 per pair	

Graining and Imitations (oak grain and 1 coat varnish)—

	Toronto, 1882, Tariff.	Montreal, 1903, Tariff.	Toronto, 1902, Tariff.
	30c. per yard	70c. per yard	35c. per yard
Other woods, add—	10c. per yard	25c. per yard	10c. per yard

Hardwood Finishing—

	Toronto, 1882, Tariff.	Montreal, 1903, Tariff.	Toronto, 1902, Tariff.
	Not mentioned	1.00 per yard	$1.00 per yard

Calcimining (plain surface)—

	Tariff.	Tariff.	Tariff.
	12½c. per yard	13c. per yard	12½c. per yard

Paperhanging (common 1-edge trim)—

	Tariff.	Tariff.	Tariff.
	17c. per roll	30c. per roll	17c. per roll
Common 2-edge trim—	30c. to 35c. per roll	35c. per roll	30c. per roll

Now, sir, I could go on multiplying these examples, but I think enough has been said to convince us all that either our predecessors in Toronto or our brethren in Montreal have been, and are now, very rich, or we at present in business are not able to make a decent living, and simply manage to dodge our creditors.

What shall we do about it?

I think that we should at once take steps to advance our prices at least 25 per cent., in order that we may obtain that which properly belongs to us.

*Paper read before the Toronto Painters' and Decorators' Association on April 6th, by Mr. G. W. Knott. From *The Canadian Painter and Decorator.*

INTERCOMMUNICATION.

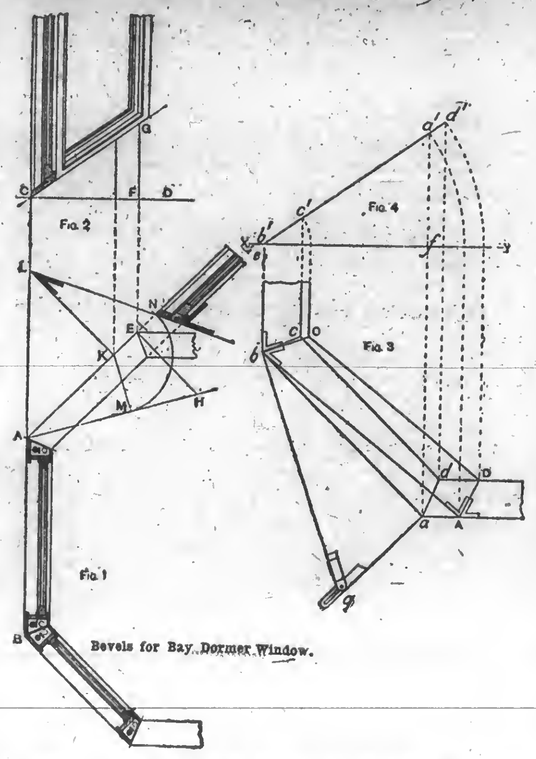
[Communications sent to this department must be addressed to the editor with the name and address of the sender attached, not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Don"—Would you kindly inform me what is the usual Canadian rule as to the level of buildings during erection. In British and French specifications a clause is inserted that no part of the walls are to be raised above another more than four or six feet during erection. The meaning of this clause is obvious, equal settlement of green walls and foundations. This question has been raised by the manner of constructing the Alexandra School on Broadview avenue. Back, centre and north and south walls were raised 17 or 18 feet above foundations. Large iron girders placed thereon and joists laid, while almost the whole of front and centre part of back walls had not a brick on top of foundations. These parts will be rushed up in a day or two. Result—cracked ceilings and walls. Another matter is. Large piles of dressed lumber are laid down, some of them 10 or 12 feet high and as broad, all new from the mill, with natural sap included. There are no cross boards or any means of air getting through those piles, a large quantity of which is planking. The result is inevitable—fermentation and rotten boarding in a short time. Surely if the Education Board does not see this matter they should employ someone who can.

Ans.—The usual practice in Canada is to never let the walls or portions of works "rack-up" more than ten feet above other parts of the wall, five or six feet, however, is oftener the rule than ten feet. Where the work is continued it makes but little if any difference, because of the fact that it takes a number of days before mortar, of the ordinary kind, sets hard enough to affect any settlement of walls. Where cement mortar is used, however, it is imperative that the courses of brickwork all round be carried up simultaneously. It is the duty of the architect, clerk of the work, or superintendent, to see that the walls are not carried up contrary to the city ordinances, or in such a manner as to be defective in any particular, and he should be the best judge of the conditions and requirements; for it sometimes happens that it is necessary to depart somewhat from given rules. With regard to the piling of the lumber in a solid manner. If it is to be in that condition over a couple of weeks it will be injured and discoloured to some extent, but, if the piles are taken down again within a short period, and either used or repiled, no harm will result, providing always the [illegible] are covered to keep out rain. A clerk of the works should be on the ground all the time and paid by the board.

From "Workman." I have built a number of bay windows in my life but never a bay dormer, and having one to build now, I find I am at a loss in laying out bevels and arranging same for work. Will you kindly describe a method for getting bevels for the sills and side lights; also please show how the mitres for the ends of sills are obtained. The bottom of sills must be parallel with pitch of roof.

Answer.—This is always a difficult problem as nearly every dormer differs from every other dormer. However, we present the following diagrams which are taken from an authority. It is specially adapted to your requirements: Arrange the plan and section as shown, and then from the bottom point of the sill draw C D at right angles to A C. From E project up and obtain the line F G. At right angles to A E set up E H equal to F G. Join A H, which line gives the true length and inclination of the front bottom edge of the sill. At any point E in A E draw K L at right angles to A E, meeting A C in L as shown. With K as centre, describe the arc M N, tangent to A H. Draw K N at right angles to K L,



so that it cuts the arc in N. This gives the true inclination of the sill, and the section of it can be drawn as shown. At Fig. 3 the outline of the sills is shown at a, b, c, d. Drawing X Y at right angles to b e (Fig. 4) project up in the usual manner, to get the elevation of the under surface of the sills and [illegible] a, b, c, d, using point e as centre, describe the [illegible] shown by c, c', d', then projecting down at right angles to X Y, and imagining b e as the hinge line (or H T) project [illegible], meeting the downward projectors in C A D. On joining these ends, the bevels for the mitred ends of the sills are obtained. The bevels for the vertical ends of the mitres are obtained as follows: At right angles to a b set up a g, making it equal to f a'. Join g b, then the angles shown by the bevels are those required.

From "Plasterer." I have taken a contract to put

down a lot of cement sidewalk in the country town in which I live. I am to receive eleven cents per superficial foot; and, as I am not well posted on this kind of work would like a few pointers on the subject, also a description of the tool or tools used in roughing the surface; also, if the amount per foot I am to receive is a reasonable one?

Answer.—In preparing for a sidewalk all the soft earth should be removed and a fairly solid bottom obtained, and this should be tamped down with a paving hammer or some other similar tool. When ready there should be laid a bed of about 4 or 5 inches of broken stones, old bricks, clinkers, rough gravel, or other like material, which should be well broken to pass at least a 2-inch ring, and should be broken *in situ*, as this process tends to assist it to become well consolidated. The upper surface should be well rammed and beaten and brought up to a level and true to line, so that the concrete will be of even thickness throughout the required floor. A great deal depends on the manner in which this is done. Unless care is exercised in doing it, the floor will be thin in one place and thick in others, and this condition is one of the causes of floors cracking.

A stretch of work having been got ready, divide it into bays or sections as shown in Fig. 5. In path-

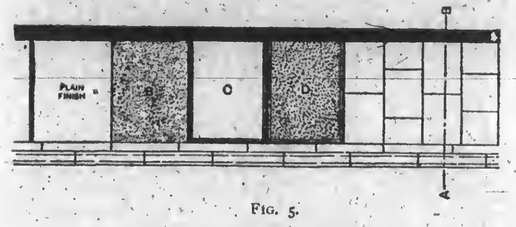


Fig. 5.

way making or street paving, the size of those sections is determined by the width of the proposed sidewalk; in Fig. 5 they are shown. 6 feet by 4 feet 9 inches which is a useful size; but with floors and yards the sections should not exceed 60 superficial feet in area, the division of the section being determined according to the size or area of each floor or yard. It is not usual to divide grooved work into bays or sections, except for the purpose of forming spreads to work to, by which the work is laid and ruled to the required falls. The points of each day's work occur in the grooves, and if the operator is a neat workman the joints are not seen; and it is best to work by pattern grooved work continuously, so as to obtain uniformity and trueness of lines and grooves, which uniformity cannot be properly assured if the work is laid in alternating sections. The main reasons for laying concrete paving in sections is, first, to allow for the expansion and contraction that occur in all cement concrete paving; and, secondly, to give the operator better facilities for getting about his work. The time to elapse for filling in the odd bays is from forty-eight hours and upwards, according to the condition of the job. The gravel bed should be well rammed down before any concrete is laid on it, and it should be fairly level, so as to insure an even thickness of the concrete.

When all is ready, mix the materials in the usual manner, adding the cement as it is mixed, throwing the whole in a heap and turning it over two or three times while dry to insure its proper incorporation, panning it out in the form of a ring, adding the water, and throwing in the sides and so gradually forming a heap, turning the stuff over twice more, and adding more water if required from a watering can. The total time, from first to last, should not exceed half an hour for a two-sack mix. Lay this stuff on the foundation already made, spreading it with a hand float and trowels to about 18 inches wide. When the work has stiffened up a little go over it again with a hand float, sprinkling a little dry neat cement over the face of the work as the floating proceeds. If a plain surface is required, it should be trowelled three or four times, and while it is hardening it should be stripped with a fine hair brush to remove all trowel marks and give it a fine and uniform finish. If, however, the surface is to be crimped or indented, as marked at B and D, Fig. 5, this should be done whilst the work is in a fairly soft state, otherwise the machine will not work properly, and the paving will have a poor appearance. After bringing the surface to a good face (say with the second trowelling) run a crimping machine (Fig. 6) round the edges of sections, as C and D, Fig. 5, taking care to keep the machine true and straight along the laths; and if a rolled or indented surface is required, begin with the roller (Fig. 7) and work from curb to wall as shown by Fig. 5. Allow the machine to run freely, and have a bucket of water handy to keep the machine wet, so as to prevent it clogging with the

Fig. 6. Fig. 7. Fig. 8.

matrix. There is just one particular period in the setting of the matrix when the rollers will make a first-rate job; whereas if the matrix is too stiff the machine will drag and pull the work; while if it is too soft the machine will not work at all. Specifications for work of this kind differ a great deal according to the fancy or experience of the architect or engineer. Some require the work to be done in three layers: first a bed of hard core, then a bed of ordinary ballast concrete and sometimes slag is specified. Often architects will specify 1 and 1, others 2 and 1, 2½ and 1, and others (fortunately in the minority) [illegible]. The best and most practical way is to let the character of the work govern the gauge and the thickness. Thus, all stable paving, especially for heavy horses, should be three inches thick, and gauged 2 and 1, whilst for light horses, 2 inches or 2½-inch paving, gauged 2 and 1, is quite sufficient; while for cow byres, piggeries and similar floors, 1½-inch paving, gauged 2 and 1, is sufficient. For coach houses, washing places, yards, areas, cor-

ridors, etc., 2-inch paving, gauged 2½ parts granite chips and one part cement, is ample; and the same remark applies to street pavings if the stuff is laid in one coat on a hard core foundation. Generally the latter is laid in two coats, especially it the face is to be rolled or crimped as B and D, Fig. 1; and it is most practical to do it in this manner, and also to use a finer grain of granite for the top or finishing coat, in order to ensure a clear imprint with the machines. The gauge for the two coats is 4 to 1 for the bottom one, and 1 to 1 for the top one, thus making the work equal to 2½ to 1. Great care must be taken that the two coats are laid simultaneously, otherwise the two bodies will not properly adhere, and where possible, the finishing coat of all pavings laid on concrete should follow whilst the concrete or foundation is in a moist or binding state. Should it not be practicable to do this, the concrete should be well brushed to remove all dust, then well watered (generally over night), and just before laying the paving material it should be treated with a coating of cement grout. By this means only can proper adhesion be obtained. Figs. 6, 7 and 8 show the rolled tools used by cement workers for crimping, indenting and dividing, the work when completing. As regards the price per superficial foot you are to receive, eleven cents is a fair price for ordinary work. We have known as low as nine cents given and the contractor did good work and made a fair profit. Much depends on the rate of wages paid, cost of gravel and cement and the distance the materials have to be hauled.

From "Carpenter." Please inform me of a method or methods of shingling hips so that a roll is not required to cover the joints?

Answer.—There are a number of methods, all of which have more or less value, and any of which is better than that of covering the hip-joint with rolls or combs. Six examples of shingling are shown in Fig. 9, which are taken from "Hodgson's Modern Carpentry." The first sketch, A, is intended for a hip, and is a fairly good example, and if well done will insure a water-tight roof at that point. In laying out the shingles for this plan the courses are managed as follows: No. 1 is laid all the way out to the line of the hip, the edge of the shingle being planed off, so that course No. 2 on the adjacent side will line perfectly tight down upon it. Next, No. 3 is laid and is dressed down in the same manner as the first, after which No. 4 is brought along the same as No. 2. The work proceeds in this manner, first right and then left.

In the second sketch, B, the shingles [illegible] the hip in a way to bring the grain of the shingles more nearly parallel with the line of the hip. This method overcomes the projection of cross-grained [illegible] at C and D. In putting on shingles by this method a line is snapped four inches from angle of hip on both sides of the ridge, as indicated by the dotted lines in C, then bring the corner of the shingles of each course to the line as shown. When all through with the plain shingling make a pattern to suit and only cut the top to shape, as the bottoms or butts will break joints every time, and the hip line will lay square with the hip line, as shown at D; thus making a first-class water-tight job, and one on which the shingles will not curl up, and it will have a good appearance as well.

At E a method is shown for shingling a valley, where no tin or metal is employed. The manner of doing this work is as follows: First take a strip 4

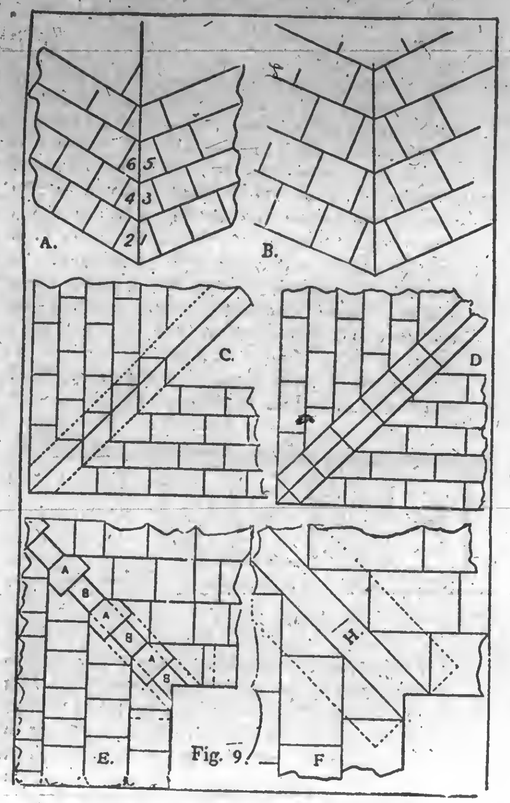


Fig. 9.

inches wide and chamfer it on the edges on the outside, so that it will lay down smooth to the sheeting, and nail it into the valley. Take a shingle about 4 inches wide to start with and lay lengthwise of the valley, fitting the shingle on each side. The first course, which is always double, would then start with the narrow shingle, marked B, and carried up the valley, as shown in the sketch. Half way between each course lay a shingle, A, about 4 or 5 inches wide, as the case requires, chamfering underneath on each side, so that the next course will lie [illegible]

If tin or zinc can be obtained, it is better it should be laid in the valley, whether this method be adopted or not.

The sketch shown at F is intended to illustrate [illegible] could be laid with tin, zinc or galvanized iron. The dotted lines show the width of the metal, which should never be less than fourteen inches to insure a tight roof. The shingles should lap over as shown, and not less than four inches of the valley, H, should be clear of shingles in order to insure plenty of space for the water to flow during a heavy rainstorm. A great deal of care should be taken in shingling and finishing a valley, as it is always a weak spot in the roof.

MONTREAL JUNIOR ARCHITECTURAL ASSOCIATION.

The members of the above met in the rooms of the P. Q. A. A., 5 Beaver Hall square, on Wednesday, April 26th, to consider the adoption of the constitution previously draughted. Mr. Cecil Burgess presided.

It was explained that since the previous meeting the Council of the P. Q. A. A. had evinced much interest in the formation of the Junior Society, and for the more complete union of all branches of the profession in the province were anxious that the juniors should place themselves in as close touch as possible with the Association. It was therefore suggested that the name of the society should be the Sketching Club of the Province of Quebec Association of Architects; that they should always have as president someone who should meet with the approval of the Council of the P. Q. A. A.; and that they should hold their meetings in the rooms of the P. Q. A. A., which would be put at their disposal free of charge. These suggestions having been incorporated in the constitution it was approved by the meeting.

The first visit of the Sketching Club took place on Saturday, April 29th, when the members, on the invitation of Prof. P. E. Nobbs, met at the library of McGill University. The architectural department of the library was examined, and tickets admitting to study there were presented to all members of the club. Prof. Nobbs then gave a short address, which we publish on another page, on the "Value of the Study of Old Work." This was illustrated by lantern slides and by a large number of examples of measured drawings which were hung around the lecture room. At the close of the address the collections of architectural casts and photographs were examined. The Sketching Club proposes to work during the summer on the measuring of old and interesting work in the city and neighborhood of Montreal, and a prize of $40 in books on architecture has been offered by Prof. Nobbs for the best set of drawings of such work.

CONCORDIA SALUS.

MONTREAL BUILDERS' EXCHANGE.

The activity in the building trade in this city, noticed in the last issue of the CANADIAN ARCHITECT AND BUILDER, is proceeding with unabated vigor, and has awakened in its train renewed interest in the Montreal Builders' Exchange.

The directors have determined to make the Exchange a practical factor in matters affecting the building trades. They feel that it is [illegible] to have comfortable central quarters where members may casually drop in for a chat and a smoke, and thus to reduce the character of the Exchange merely [illegible] intercourse is to be encouraged; but building exchanges must aim at something more definite and practical as the outcome of such intercourse. Several of the largest exchanges in the United States and Canada have achieved what enthusiastic pioneers of builders' exchanges had proclaimed possible, namely, the formation of a regular habit of all, or at least a majority of members being "on 'change" at the prescribed noon hour, and allowing no other engagements to intrude on that hour. It can be done, and has been done by determination and united effort; but will never be accomplished by half-hearted apathy and indifference to the exchange.

The attitude of Montreal architects towards the exchange is also difficult to comprehend. Either from prejudice or some fancied breach of professional etiquette, they have hitherto held aloof from the Montreal exchange, although the most friendly relations exist between the two bodies in other Canadian and American cities, where their representatives are regularly on hand, willing, and even anxious, to discuss plans and adjust contracts on the floor of the various exchanges. It is not for want of cordiality on the part of the Montreal directors, who have time and again extended the most friendly invitations to them for closer intercourse and a more cordial attitude. Surely it is as much to the advantage of the architects as to that of the contractors that a free and amicable interchange of views should be the keynote of future relations!

The directors have recently appointed a permanent secretary, who will be at the disposal of all members, to look after their interests and to give careful consideration to their suggestions. It is their earnest hope and ultimate aim to see the Builders' Exchange as it should be, a rallying point where all the various branches of the building trades—represented even where they have already their own special trade organizations—may meet around a common centre as their natural home.

J. H. LAUER, Secretary.

[Friendly relations may and do exist between architects' societies and builders' exchanges, and points concerning the conduct of business which require settlement are settled by a conference of representatives, but precisely what is meant by representatives being "regularly on hand," or by the discussion of plans and the adjustment of contracts "on the floor of the various exchanges" is not apparent, for certainly, in the ordinary sense of these expressions, it is news that anything of the kind takes place in Canada.—Ed.]

BUILDING IN MONTREAL.

Building operations in Montreal during the month of April showed a very large aggregate both in the value of the structures started and the number of permits issued by the city building inspector. The following table gives a good idea of the conditions:

April permits.	1905.	1904.
New buildings	$68,001	$428,243
Alterations	98,347	67,595
New building permits	159	111
Alteration permits	91	81
Increase in value of buildings		$219,758
Increase in value of alterations		30,750

The building operations for this year are likely to surpass anything in the history of the city, according to the records of Inspector Chenest's office. The first four months of the year show the following gratifying figures:

January	$ 87,400
February	100,215
March	370,450
[illegible]	[illegible]
Total value	$1,100,100
Alterations—	
January	$ 10,380
February	21,235
March	119,230
April	98,347
Total value	$249,192

Total permits to May 1, 1905	479
Total permits to May 1, 1904	349

THE ROYAL CANADIAN ACADEMY EXHIBITION.

The exhibition of the Royal Canadian Academy, at the rooms of the Ontario Society of Artists, Toronto, has a general level of excellence that is higher than formerly. For this reason, perhaps, there are fewer salient pictures. It is not only that technical skill is more generally high, but that the main thing, imagination, for want of which exhibitions used often to be disappointing, has found its way into most of the work; and usually in its best form, the unobtrusive. It is this quality that makes a picture, but it is hard to define it or to say always where it comes in. The true instinct for it is delicate, in both the artist and the spectator. We do not like to have it thrust upon our attention, labelled by exaggeration; and to the artist it is its very subtlety, its inherence in prosaic facts, that attracts his effort to express it. It is for this reason that truth is so much insisted upon by the critics and so loved by the artist. It is because the idea lies in the truth, in certain parts of it particularly, that he is so painstaking in following truths, and so particular in his selection of them. It is what is suggested that makes the picture, but the suggestion must be made by the facts. We used to have the facts without the suggestion. The suggestion is now much more there too, and this is the gain.

Imagination is very much akin to humour in that it sees facts in their relation to life. The seriousness of Mr. Wyly Grier's little daughter, standing up to be painted in his red militia waistcoat, makes a picture because it is the expression of a child's attitude of mind towards the proceedings. It is a pretty attitude of mind and makes, therefore, a pleasing picture. We are, no doubt, indebted to the artist for perceiving it in the first place, and for its maintenance in his representation through times of subsequent familiarity and even weariness.

It is this perception of the poetry that is involved in the ordinary affairs of life that makes the true imagination, and the true picture is that which makes clear the poetic points so that others can see them as they appeared to the artist. The artist is, therefore, an interpreter of life. He may interpret but one kind of truth, as the painters of one theme; he may isolate the most suggestive truths as the impressionists; but the greatest artist is undoubtedly he who is able to build up his theme with the greatest number of truths and, by a fine instinct for the proportion of things, still make it the thing expressed in his picture, which, perhaps, attracts at first sight simply from its truth to nature.

It would be a pleasure to comment upon the exhibition more in detail if space would permit. There are many pictures of interest. This by Mr. W. Grier is selected only as a simple illustration of a quality shared by most of the other exhibitors and by other portrait painters. It would be a pleasure to try to give a juster view of some of the pictures than is given in the daily press. The fatherly young man who, on behalf of the Toronto *Globe*, could only say of Mr. Homer Watson that he "does not seem painstaking," is hardly adequate. Not that this is a bad criticism if it were meant well. That he is not painstaking is, from all accounts, the last thing that could be said of Mr. Watson, but that he does not seem painstaking is true, and is as it should be. But what a little to say of Mr. Watson who, if anybody, is the picture maker, the painter of imagination; who shows us the poetry of the country life, of work out of doors in the chances of the weather; whose pictures are always full of the feeling of fresh air and the expressiveness of nature.

Surely no one ought to review for the press such a serious matter as the Academy Exhibition but a man over sixty who knows something.

BRITISH COLUMBIA PLUMBERS ORGANIZE.

The master plumbers of British Columbia have formed an association to be known as the "British Columbia Provincial Association of Master Plumbers, Gas, Steam, and Hot Water Fitters."

The initial convention of the Association was held in Vancouver on April 21 and 22nd last, when the Association was formed, and the necessary officers and committees elected. Mr. J. J. Coughlan of Victoria, was elected president; Mr. W. H. Morton of Nanaimo, vice-president; Mr. J. G. Anderson of Vancouver, secretary, and Mr. C. Weeks, Vancouver, Treasurer.

The above mentioned gentlemen also compose the Executive Committee. A Sanitary and Legislative Committee and an Apprenticeship and Assay Committee were also appointed, consisting of delegates from various parts of the province.

At the opening of the convention, considerable time and discussion was given to the question of the need of organizing and what the object of the association should be. Mr. Coughlan in a well delivered speech explained the need of organization for the purpose of protection against the custom of wholesalers in ignoring the local plumber by selling direct to the consumer, and for the mutual help and benefit organization would give. Various other gentlemen spoke and all expressed themselves as favorable to the formation of a Provincial Association and advanced many points in favor of the proposal. The meeting then resolved itself into a committee of the whole to prepare the Constitution and By-laws.

The Constitution and By-laws of the National Association were adopted with such modifications as were necessary to a provincial organization. Article II of the National Association Constitution setting forth the objects of the Association was adopted in its integrity.

This Association is organized for sanitary, commercial and social purposes, and has for its special object the advancement [illegible] the latest discoveries of science appertaining to sanitary laws; to promote and combine the interest and influence of members for the protection of trade against imposition, encouraging invention and improvements in sanitary appliances; fostering an interchange of thought, and eliciting and communicating, for the benefit of each member, the best talent and the result of the experience and ability of all; to promote amicable relations with employees on the basis of mutual interest and equitable justice to both journeymen and master plumbers; to encourage Dominion and provincial legislation for the furtherance of the interest of sanitary laws; to secure for the members of the trade equitable treatment in their dealings with manufacturers and dealers in supplies; to regulate the system of apprenticeship and employment, so as to prevent as far as practicable, the evil growing out of deficient training in the responsible duties of selecting, arranging and fitting up materials, relating to the hydraulic and sanitary condition of dwellings, public and private institutions; to create and maintain a sanitary code at as high a standard as the progress of science, (chemical, philosophical and mechanical knowledge) teaches: and we agree to carry forth, with tireless zeal, the work to which the above language relates.

It was decided to hold the next convention in Victoria on Good Friday, 1906, and to have the Provincial Association represented by two delegates at the National Convention to be held in Winnipeg in July this year.

A pleasing feature of the first day was a banquet tendered the visiting delegates by the Vancouver Master Plumbers and at the close of the convention a hearty vote of thanks was tendered the local association for its hospitable entertainment of the delegates. A hearty vote of thanks was also accorded the president for the able manner in which he had presided over the business of the Convention.

Following the close of the meeting the delegates were treated to an auto ride through the city and park by the supply firm, Robertson-Godson Co.

COLONIAL CONTRACTS.

It is often pointed out that our self-governing Colonies are our best customers. They are, however, by no means as good customers to us as they might be, and no obstacles which lie in the way ought to be left unattacked until they are absolutely removed. One of these is the want of facilities given to the contractor on this side to gain the fullest particulars of works forthcoming in the Colonies. It is not that machinery is lacking which would enable the necessary information to be made available to all whom it may concern. The Colonies possess in London admirable officers in their agents-general, and most of these have also an inspecting engineer attached to them. We may say at once that no blame is attributed to these gentlemen. We have invariably found them most courteous and most willing to leave no means untried to give the fullest information at their command. The fault lies on the other side of the water. The respective governments prefer to keep a dog—and a valuable dog at that—and do all the barking themselves. When contracts for construction of railways, or tramways, or bridges, or for materials are required, tenders are invited in a Local Government *Gazette*, which practically nobody sees in England, and just sometimes there appears a notice at the bottom of the advertisement stating that a copy of the specifications may be seen at the office of the Agent-General. As little of the material required is manufactured in London itself, and as most specifications are of such an intricate nature that a firm proposing to tender would wish, and would require, to take away a copy, and refer to it over and over again while preparing their tender, the least that could be expected is that copies should be obtainable here at a reasonable price by all *bona fide* contractors. [illegible] firms have agents in the capitals of our large colonies. If the governments we refer to desire by these means to compel firms who wish to do business with them to establish agencies in the Colonies, all we can say is [illegible] pound-foolish one. The benefits conferred upon the few agencies which may happen to be in the Colony and able to undertake the special work in question, which may be narrowed down often to one, or if not to two or three who will combine, can only mean that the governments will have to pay a higher price for what they want than would be the case if the competition had been made more widely known, and this will outweigh any minor advantages accruing from the agency itself. In the second place, this only affects large houses, and the small man ought to have a chance as well. But this is by no means all. The worst feature of the proceedings is that, while our contractors and manufacturers are left to grope in the dark, our Continental competitors are placed in a much better position. As soon as these specifications are obtainable in the Colonies, the German, Belgian, and other commercial agents attached to the various consulates obtain a copy and send them, sometimes wire them, to their headquarters. The German, Belgian, etc., competitor can go into the commercial museum of his town and see the specifications, and for a few pence he can get a typewritten copy. These museums are generally worked on a particular plan, the peculiarity of which strikes one very forcibly when it is contrasted with our methods. When we have any information we trumpet it about for the benefit of the world at large, so that everyone might come and help himself. When a foreign publication, say, for instance, one of those emanating from the museums of which we have spoken above, wishes to give a tip about a forthcoming contract, they take very particular care to restrict the information closely to their own countrymen, and the announcements are worded somewhat like this: "A telephone system is to be established in one of the islands of the Mediterranean, and intending tenderers *who are citizens of this country* may obtain full information at the museum." We see similar announcements very frequently, always mingled with two regrets—the first, that we are not able to give our readers the information they require; and the second, that our methods do compare so unfavourably with those of others. We hear so much talk about more or less intricate aspects of the fiscal question by people who understand them more or less—generally less—and who are more or less disinterested—also, we are afraid, generally less—and the differential value of the gold standard, and the merits of giving long over-sea credits and other words, and words and nothing but words, until we are sick and tired of it, and do long for the interspersion of a few grains of common-sense and a little more practical method of dealing with our commercial problems.

The (London) Contract Journal.

THE DEVIL'S DOOR.

A writer in the Western Times records that at Mullion Church, Cornwall, a devil's door exists. Mr. Harry Hems says in reference to this: There are hundreds of old churches where these doors occur. All ecclesiastical edifices rejoicing in the possession of a south door, with a northern one immediately opposite to it, own a devil's door, i.e., the north one. It has been the custom ever since our Norman ancestors, after the Conquest, first introduced fonts into this country to place the font in the centre of the western end of the nave, immediately midway between these two doors. When a christening took place both doors were invariably opened, and at the sign of the Cross the Holy Spirit entered by the south door and his Satanic Majesty took a hasty departure through the north! It was for this reason that in the good old times no decent Christian cared to rest his bones in the northern portion of the churchyard—a part of God's Acre reserved, as a rule, for suicides and other unfortunates.

AMERICAN RADIATOR COMPANY IN CANADA.

The American Radiator Company has recently acquired the foundry plant of the Cockshutt Plow Company, at Brantford [illegible] view to making therein suitable lines of IDEAL Steam and Water Boilers, for which a good demand already exists throughout the Dominion, largely due to extensive advertising. The Company will not for the present manufacture Radiators there.

The continually expanding unity in commercial affairs now developing between the States and the Provinces, and the similarity of demand and trade conditions all combine to justify the expectation that the American Radiator Company can prove the broadest application of its title and policies on Canadian soil, as well as it is doing in the United States.

Mr. J. M. Gander, plasterer and contractor, of Toronto, is paying a visit to England, after an absence of eighteen years.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.
22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	S. G. CURRY,	"
2ND VICE-PRESIDENT	W. A. LANGTON,	"
TREASURER	HENRY SIMPSON,	"
REGISTRAR	W. R. GREGG, 96 King St.,	Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	"
J. WILSON GRAY	"
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD, Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal.
2ND VICE-PRESIDENT	R. P. LEMAY, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. R. BROWN.

P.Q.A.A. COUNCIL.

JOS. VENNE	Montreal.
H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOLDEN, President.	T. MARTIN.
GEORGE DUTHIE, 1st Vice-President.	CANNON, Jr.
JOHN MALONEY, 2nd Vice-President.	R. G. KIRBY.
	GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.

LONDON BUILDERS' EXCHANGE

HENRY STRATFOLD, President.	J. JONES.
GEORGE C. YOUNG, 1st Vice-President.	[illegible]
JAS. S. LUNEY, 2nd Vice-President.	JNO. WHITTAKER.
GEO. S. GOULD, Secretary-Treasurer.	L. H. MARTIN.
[illegible]	A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M. FRASER
H. A. BELL, Treasurer.	E. G. BURNE
T. BRADERY.	D. BAUER

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BUROEAULT, 2nd Vice-President. ALEX. MCNEE IRWIN, Sergeant-at-Arms.
Directors: T. G. Latimer, E. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alaip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Collier, T. A. Girolin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.	JOHN DUTHIE
EDWARD M. ROBERTS, Vice-President.	JOS. O. DESLAURIERS
PHILLIP LASHER, Hon. Treasurer.	JOHN GRAY,
J. HERBERT LAUER, Secretary	GEO H. HOOD.
JAS. SIMPSON AND J. H. HUTCHISON.	Past Presidents

CHAMBRE SYNDICALE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAUVAGEAU,
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHAPENTIER, JR., 2nd Vice-President,	H. CONTANT.
ALCIDE CHAUSSE, Treasurer.	EZ COTE
N. T. GAGNON, Secretary.	LOUIS PAVETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

ARCHITECTURE AT THE S. P. S.

There are six students of architecture in course at the School of Practical Science, in the first and second years.

The new Y.M.C.A. building in Vancouver is well under way, the outer walls are up and the roof in place. The general design of the building is now evident. One of the most important features is the gymnasium which is one of the largest in Canada being 60 feet long and 50 feet wide the ceiling being 20 feet high. The building will be heated and ventilated by the Plenum System, and ducts running to every part of the building, keeping temperature at the proper degree. By the Plenum system, warm fresh air is supplied through these ducts to every part of the building from an electrically driven fan in the basement. Mr. E. E. Blackmore is the architect of the building and Mr. A. E. Carter the contractor in charge of the work.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

VIEW OF THE FRONT.

No. 17 Elm Avenue, Toronto.

[illegible], Architects.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1905

CHURCH OF S. PETER AND S. PAUL, FALL RIVER, MASS.

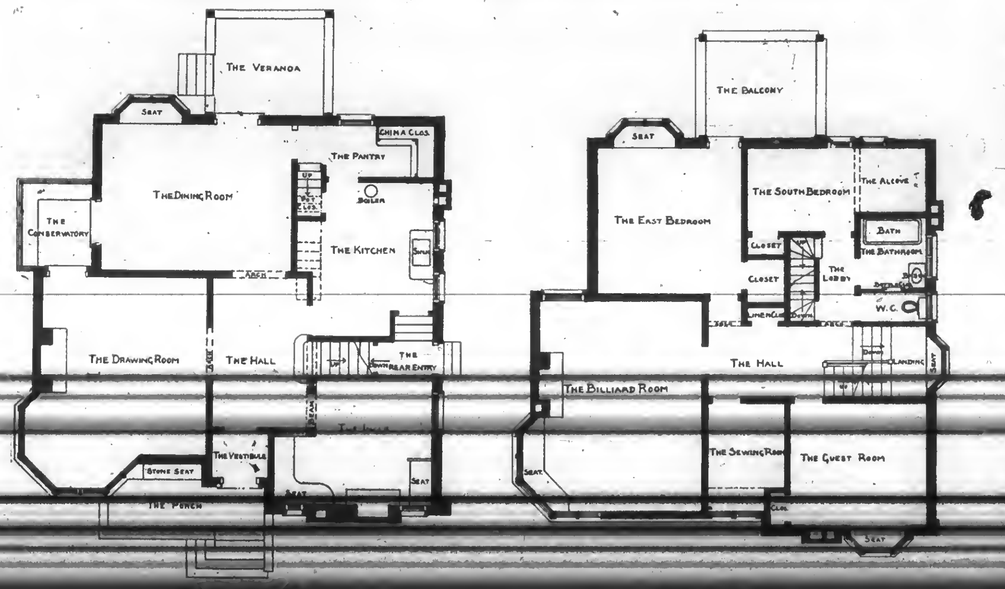
MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS, BOSTON.

(From the Eighteen Club Exhibition)

GENERAL VIEW OF FRONT.

CONCRETE HOUSE OF MR CHARLES A. MATCHAM, ALLENTOWN, PA.

VIEW OF THE INGLE



No. 17 ELM AVENUE, TORONTO.

MESSRS. CHADWICK & BECKETT, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1905

The Canadian Architect and Builder

C. H. Mortimer Publishing Company - - - - Publishers.
W. A. Langton - - - - - - - - Editor.

Offices: Confederation Life Building, Toronto, Canada.

Vol. XVIII.—No. 210. June, 1905.

ILLUSTRATIONS ON SHEETS.

Hall in No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R.C.A., Architect.
Staircase in No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R.C.A., Architect.
Bishop's Court Apartment Building, Montreal.—Messrs. Saxe & Archibald, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R. C. A., Architect.
Station at Bismarck, North Dakota, for the Northern Pacific R. R.—Messrs Reed & Stem, Architects, St. Paul, Minn.

CONTENTS

Editorial	81-82	Utilization of Sky Scraper Roofs	93
The Garden Front	83	The Underwriters' View of Some Failures of Construction	94
Hamilton Convention of Master Painters and Decorators	84	The Rowton Houses	94
Our Illustrations	85	A New Style of Stove	94
Books	85	Profitable Treatment of Sewage	94
Lightning Research	86	Personal	96
Investigation for the Improved Use of Concrete	86	Retroactivity in Building By-Laws	ix
Sky Scraper Churches	87	Inspect Fire Appliances when Installed	ix
A Perfect Sewerage System for Rural Homes, Schools and Factories	88-89	Competitive Prize Essays on Hydraulic Cement	x-xi
Intercommunication	90	Licensing Architects	xii
Garden Architecture	91	Mr. William Simmons	xii
A Utopian Hotel Bedrooom	92	Mr. John D. Warwick	xii
The New York Building Failures	92	Old Glass	xiii
Moving Platform Subway	92	Mechanics' Lien for Wages in British Columbia	xiv
Montreal	93	Arbitration	xv

OUR VANCOUVER OFFICE.

The publishers of this journal have recently established an office in Vancouver for the purpose of looking after more carefully the interests of subscribers and advertisers in British Columbia. This office is located at 536 Hastings Street, Suite 3, opposite Molson's Bank, and is in charge of Mr. G. A. Gall, who will be pleased to meet any of the friends of this Journal, and to serve their interests in any possible way.

Free Plans for Cottages

The Commercial Club of Indianapolis has applied to the architects of the city requesting each to furnish the Club with plans and specifications for a small house that could be built for [illegible] $1,500. The plans are to be given all possible publicity to insure their use, and printed copies of them, filed at the Commercial Club, will be furnished to everyone who applies [illegible] the cost of their printing. It is expected that the architects will respond favorably as a matter of public spirit and, with the plans thus furnished available, cottages will both serve the purpose of their owners much better than they do now, and will also contribute to the architectural beauty of the city. In order that they may do the latter it will be necessary for the architects to lay aside ambition and, if the competition feeling comes over them, feel that they are competing for the beauty of simplicity.

The Sanitariness of Beauty.

The *Lancet* sees in the adoption of a forced draught for destructors in London a presage of the abandonment of tall chimneys for factories and of a smokeless London. One would expect the rest of the article to be chiefly concerned with the delights of cleaness and fresh air, both matters of interest to Englishmen. But not at all. The gain in health that [illegible] is to come through the eye from seeing more beauty, or at any rate less ugliness. The *Lancet* does not positively say that the sight of beauty is tonic, but it does say that the sight of ugliness is de[illegible] can be, so to speak, noisome to the eye, and, when the harmony of prospect is ruthlessly disturbed, the eye that detects it transmits a feeling of pain to the whole system. 'It gets on one's nerves,' we say of an ugly sight as of an ugly sound, and the expression has a substratum of physiological truth." So here is en-

couragement for the architect, who aims at beauty, to think well of his aim. His is a benevolent profession.

Radiation from Radiators.

An ingenious correspondent of The Builder has entered a protest against the abandonment of open fireplaces in hospitals and similar places where people remain in a room for long periods continuously. Having first established that there is no radiant heat from a radiator, on the very slender grounds that paper held before a hot water radiator will not scorch, (that is to say that 150° of heat will not do the work of something over 212°) he argues that all heat from a radiator must be by convection. Therefore it is impossible to impart heat to the human body unless the air is at a temperature of over 98°. And, as air heated to this degree is unbearable, he asserts that the body, which does radiate heat, must, be, in a room heated to a bearable degree, always parting with its heat. He therefore condemns dependence upon "radiators" (of which he cannot bear to speak except in inverted commas) and advocates the retention of open fireplaces as well. In this he will have our sympathy. A cool house with a hot spot is the greatest comfort, and they do well in England to stick to the open fireplace, as long as the house is not too cool and they have not got to stick to the fireplace too close. But it will not do to base consideration of the value of hot water heating upon a false premiss that hot iron does not radiate heat. It is possible, much as we may regret it, to warm one's self at a radiator; and it is not necessary, much as we wish it were, to have a fire in every room. Fortunately a fireplace has a perpetual function, in making a room habitable, which justifies its insertion for occasional use to increase its warmth.

A Very Modern Building.

The Leonardt Warehouse, in Los Angeles, Cal., with an area of 104 × 150 feet, is built entirely of concrete. The span is the remarkable feature. It is a one storey building and was intended to have a steel trussed roof; but the owner consulted Mr. L. J. Mensch of Chicago, as to the feasibility of an arched roof of reinforced concrete. As the roof had to carry a suspended gallery on each side, 16 ft. wide, (calculated to carry a load of 150 lb. to the sq. ft.), and also suspended tracks for light travelling cranes, the idea of an arched roof was abandoned in favour of straight girders. The girders have a span of 102 ft. and are 16 ft. 6 in. on centres. The girders are 14 in. wide, straight on the under side but pitched on top to the slope of the roof; that is to say, they are 6 ft. 6in. at the centre of the span and 3 ft. 6in. at the ends. Brackets projecting about 4 ft. connect the girders with 2 ft. x 2 ft. reinforced concrete piers. The walls are of hollow concrete blocks and are 1 ft. thick. The purlins connecting the girders are 6 in. x 11 in., 17 ft. on centres.

Over this, for waterproofing, was spread a roofing composition. There are six sheet-metal and wire-glass skylights.

The building is said to have been erected in less time than it would have taken to deliver the steel trusses. The centring took about two weeks, the concreting one. The concrete was composed, in the lower part of the girders of one part cement (Iola or Colorado), 1½ parts of sand, and 3 of crushed granite; for other parts the porportion was 1 : 2 : 4.

The concrete girders and roof cost more than steel trusses and corrugated iron, but this difference in price was offset by building the walls of 12" concrete blocks instead of 17 in. brick, and by the use of reinforced concrete footings.

The Rosedale Association, Toronto.

As an instructive illustration of what can be done by united action to keep a neighbourhood from injury, the Directors' Report, presented at the annual meeting of the Rosedale Association in Toronto, is interesting reading. Rosedale is a distinct district in Toronto, cut off in a natural way by ravines, and, as these force some curvature upon the roads, the distinctness from rectangular Toronto is still further emphasized. The residents formed an Association two years ago, to obtain recognition by the city authorities of the principle of local option in matters not in conflict with the general welfare of the city, and to see that the ordinary functions of the city departments were properly attended to in their case. Since then the Act has been passed empowering cities to establish residential districts by By-law; and Rosedale promptly had itself made a residential district; so that neither the butchers, apothecaries and undertakers, (the pioneers of civilization) nor the Chinese laundryman, (the harbinger of the yellow invasion) can plant their outposts there. They have attacked and made to move on two disagreeable smelling industries. The Association have prevented the erection of a crematory in their immediate neighbourhood and subsequently of a planing mill in the same place. They have poked the city up to keep in proper repair the bridges which form their way of approach across the ravines. They have made an alliance with the Park Commissioner so that he has consented to take them into his councils in the matter of planting trees and in the still more anxious matter of cutting them down. And sundry sidewalks and roads for portions of Rosedale, which would be constructed in the ordinary course of affairs, have been got through with greater smoothness because endorsed by the officials of the Association. There is no question but that, in serving their own interests, the property owners of Rosedale are serving the interests of the whole city. Rosedale is now one of the places to which the tally-ho drivers from the hotels take the summer visitor. It is a question if they would continue long to do so if the outer edges of the district were eaten into by obectionable industries and the centre spotted with supply shops. Beauty must be massed to tell, in a city as in any other work of art. Good buildings here and there throughout a town are still good buildings (though not so effective as in conjunction), but the town is nothing. Since we have come to conceive of cities as susceptible of design, we must, in considering their beauty, aim at the secret of all good design—breadth, which has been defined as a great deal of one thing in one place. It does not do to allow a good neighbourhood to be frittered away for want of attention. And the best way to prevent it is the association of neighbours for its preservation and improvement.

THE GARDEN FRONT.

For five months in the year, in this country, it is a pleasure to have some land about one's house and be able to get out of doors. During the course of three of these months there are days so hot that to sit out of doors, instead of in the house, and if possible to dine out of doors, is the only way to keep reasonably comfortable. The invariableness of the porch or verandah in new houses, even of the smallest kind, and the outbreak of additions of this sort to every kind of old house shows that public attention is aroused to the inadequacy of the old fashioned habit of sitting on the front door steps in hot weather.

But a porch in the same position, close to the street, is no great gain; especially when the street has rails upon it and has reached the high development of a three minute service. Here the porch is not the poetical feature it might be in a village. It suggests not the fresh air of summer and the quiet of moonlight nights but the crude disturbances of the trolley car; a rush and a roar every minute and a half, followed by a cloud of dust that spreads wide and settles on everything.

FIG. 1.

The proper place for sitting out of doors in connection with a city house is at the back. The English house shown in the cuts (taken from an English journal), is an excellent example of the difference between front and back as a place for out of doors life. In this case, if anywhere where the house is on a street, the front would be acceptable; the neighborhood is suburban, the house set well back from the road, and the road is quiet. But how much more retired the "garden front" is! How much more dignified to live out of doors there than in the front, in the face of the public!

FIG. 2.

The difficulty with us is how to get back the use of the rear of the house for the family, after having for so long devoted it to the service department.

With a basement kitchen the problem is easy, but usage in a great part of the country is against that plan. Servants prefer, in a small house, to be penned up in the smallest possible kitchen in the rear of the ground floor rather than have plenty of room in the basement and the possible privilege of an outlook on the front. The trouble is difference of level between the kitchen and the dining room and front door. And prospective housekeepers will not accept the risk of having a basement kitchen and finding that they cannot get servants to fill it. That this is, to a great extent unnecessary apprehension is proved by the smoothness with which domestic affairs continue in the cities which were built before the "extension kitchen" plan came in, and which continue to have houses with basement kitchens. In the more modern city of Toronto also there are certain old families, with old houses and basement kitchens, who are better served than the moderns. And in at least one new house, where the mistress, greatly daring, decided for a basement kitchen, the result has been peace below stairs and happiness above, where they have the whole floor to themselves, and (which is the present point of interest), a verandah in the rear, in which they can dine overlooking the garden.

It is worth remembering, as we are apt to think the ground floor kitchen is a modern product from which there is no retreat, that the only thing modern about it is its application to the town house, since the taste for space grew with the opportunity this country affords and the English idea of building in rows in a town was abandoned. We must remember that rows and the basement kitchen have never gone out in the United States, where the necessity for compactness came upon them as early as the taste for space, and that when our time comes when the kitchen must be either at front or back (because there is no side) some relief will come to us from the United States in the form of the high basement.

The "American basement" is this much better than the English, in point of service accommodation, that it is all out of ground and the servants are not interred. In point of service again, attendance on the front door is reduced in labour for all calls that do not involve communication afterwards with the living rooms. Otherwise there is not much difference in this point, except that in a well houses it is very likely that the dining room will come down stairs and occupy the garden side, transforming the plan thus from an elevated basement to a lowered ground floor, for there is probably be a sub-basement for heating.

This is, in effect, what we have to aim at in the meantime, in our ground floor which has not descended. If we are to have the garden front free for family use the kitchen must come to the front. The servants will not object to that; and it will keep them cheerful, which nobody else will object to.

There are examples of this plan in houses facing north, which thus get the kitchen in its proper quarter,

in the north-east out of the sun, while the living rooms on the south are in it. Public opinion is nervous about the appearance of servants at the front windows, and sometimes the kitchen windows are kept uncomfortably high for this reason. It is not necessary to have windows too high to see out of in order to conceal the operations of the kitchen. Where there has been less caution in this respect there is no sign of the kitchen to the passer-by. Would it matter so much if there were? In no country in the world is the dignity of the dwelling more perfectly sustained than in England. Yet as you pass by the wide basement areas of a London house, in the best quarters, you can look down into the servants' hall, which is usually to the front, and the spectacle of the servants eating, always eating, only adds to the magnificence of the conception. But there is no chance for such conspicuousness as this in a ground floor kitchen. With a floor 3 ft. or so above grade (which means more at the sidewalk) a window set with the stone sill 3 ft. 6 in. above the floor should conceal the servants without immuring them.

In a wide house it is easy to place the kitchen anywhere. It is the narrow house which really raises the question how to avoid the plan of lapping the kitchen extension over the rear end of the dining room, or, as is often done—too often—giving the full rear end to the kitchen and letting the dining room in the middle get its light from a 6 ft. passage between it and the neighbor.

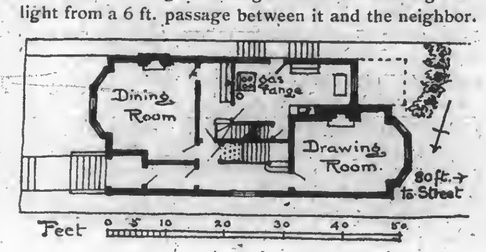


FIG. 3.

It would be easy again to put the kitchen in the middle and let it suffer. But that will not do; a basement kitchen would really be better. The plan of Fig.

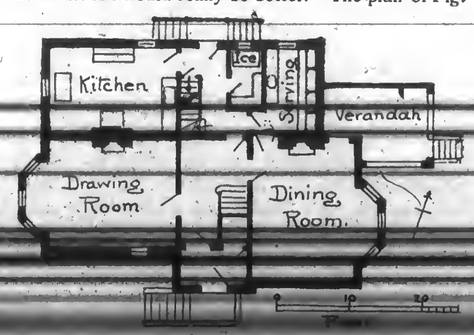


FIG. 4.

3*, a house on a 30 ft. lot, with 3 ft. of passage on each side, suggests a solution for a house looking East. The kitchen still looks into the garden but a little back of the drawing room, and with a small space of its own devoted to a clothes line and screened off from the garden by a row of shrubs.

But an outlook to the street is the best, in spite of public opinion to the contrary, and especially for the small house with one servant who requires much cheering to support her secluded life. If the test of a good rule is that it works both ways; the case for a garden front is clear; for the publicity and racket that degrade a front verandah and its occupants become life and cheerfulness and wholesome touch with the world for the solitary occupant of the kitchen.

One more plan, Fig. 4, showing the case of a house facing west, but with a little more ground this time, will perhaps help to suggest further exploration in this matter which is really of the most serious importance for city house planning. Though our houses are detached they are essentially front-and-back houses. There is the advantage over the row plan that we can light stairs and passages from the middle of the house; but the living rooms should face front and back and the inner side of the lot, where we have always a hundred feet or so of land, should be a garden and should be part of the living rooms as an additional space for summer use.

*The absence of a garden entrance in this plan, other than from the front door or by the kitchen steps, is due to the garden being for the eye rather than for the habitation. The house lies between two streets about 150 ft. apart, so that neither side is private. The out of doors quarters are in a balcony (shown by dotted lines) which opens off a sitting room above the drawing room.

THE HAMILTON CONVENTION OF MASTER PAINTERS & DECORATORS.

At the meeting of the Canadian Association of Master House Painters and Decorators, to be held at Hamilton on July 25th, 26th and 27th, the following papers will be read:—

"Master Painters' Associations and Why We Exist," by Mr. J. W. Morley, Winnipeg.

"The Advantages of the Open Shop to Employer and Employee," by Mr. A. N. Dubrule, Montreal.

"The Importance of Bookkeeping to a Master Painter," by Mr. Frank H. McCausland, President of the Toronto Association.

"Measurements and Prices," by Mr. J. W. Knott, Toronto.

"Simple Methods of Testing Painters' Materials," by Mr. Robt. Simpson, Sarnia.

"The Paper Hanger and His Difficulties," by Mr. Harry Holcombe, Hamilton.

"Zinc vs. Lead, Its Advantages and Disadvantages," by a member of the London Association.

"Apprenticeship and Technical Schools." (A continued paper) by Mr. W. T. Castle, Montreal.

"Fate of the Master Painter as Sub-Contractor," by a member of the Montreal Association.

"Lead Tests," by Hamilton Association.

"Question Drawer," conducted by expert.

The Times says that students of applied mechanics at Cambridge are "taught to look at mathematics from the practical standpoint—that is, as a means of predicting the behaviour of things under given circumstances." This makes an excellent

There is to be a twenty-storey tenement house erected in Brooklyn, N.Y., for the express purpose of providing a refuge for people with children. The birth of an American citizen in many apartment houses means the expulsion of the parents. One is faintly reminded of Adam and Eve, but the analogy between the garden of Eden and a flat is imperfect. In Mr. Oliver H. P. Belmont's new tenement house in Brooklyn, prospective tenants must have at least one child to make them eligible for admission. Special provision will be made for the entertainment of children, and, as the building will cover a whole block, a play-room or rooms of adequate dimensions can be provided

OUR ILLUSTRATIONS.

NO. 500 WILBROD ST., OTTAWA, J. W. H. WATTS R. C. A., ARCHITECT, OTTAWA.

We give the street view of this house (which is interesting as a piece of formal composition) and two views of the hall. The situation on the Rideau River is attractive.

PASSENGER STATION AT BISMARCK FOR THE NORTHERN PACIFIC R. R. MESSRS. REED & STEM, ARCHITECTS, ST. PAUL, MINN.

The testimony of a passenger upon the Northern Pacific as to the agreeableness and architectural quality of the surface of this concrete building induced us to procure the photograph of it which is reproduced in the illustration sheets. By inquiry we find that the surface was produced in the following way. The outside inch of concrete was mixed with Georgia marble chips and tamped close to the form. After this material had set sufficiently the form was removed and the entire outside surface gone over with a steel brush producing a pebble dash effect by rubbing the material off the Georgia marble. The tamping causes a slight projection at the bottom of each layer. This was treated with the point with imperfect results.

As this imperfection gave part of the character that pleased our informant, the news that the architect has succeeded elsewhere in removing the projections entirely, by using the steel brush on them while the cement was soft enough to rub out, is somewhat disappointing. There are, however, still the layer lines to enrich the surface. These are said to be caused by the different mixtures coming together imperfectly. The result is happy, and perhaps shows the better for brushing, for the lower work is evidently more carefully treated than that which is high up and, as can be seen in the arcade under the shadow of the eaves at the end, the white lines are very conspicuous there.

BISHOP'S COURT APARTMENT BUILDING, MONTREAL. MESSRS. SAXE & ARCHIBALD, ARCHITECTS.

The building has a frontage of 98' and a depth of 100' and is three storeys high and basement.

Access is obtained to the building through a large stone porch which leads into the area. This area is floored with Scotch fire brick. The entrance to the different wings is off the area. Each entrance gives access to six suites.

The entrance halls, vestibules and staircases to level of first floor, are finished in white marble. The whole finish throughout the suites is of chestnut. The woodwork in the dining rooms and living rooms has been stained dark brown; that in the bed rooms is finished in silver grey.

The building has been planned so that all trades and servants come in by the rear lane and rear staircase, communicating directly with the kitchens. The side areas are connected with the rear lane by a covered passage way at the ground floor level.

Each flat is provided with a large refrigerator which is cooled from the refrigerating plant in basement.

The suites communicate with the janitor's apartment by private telephones.

The exterior of the building is faced with brown sandstone laid up in random coursed work. All trimmings around doors, windows, etc., are of Roman stone.

BOOKS.

A TREATISE ON CONCRETE PLAIN AND REINFORCED. BY FREDERICK W. TAYLOR M.E. AND SANDFORD E. THOMPSON S.B. PUBLISHED BY JOHN WILEY & SONS, NEW YORK. PRICE $5.00.

The many complications in the cement processes appear to be fully treated in this volume, and there are special chapters by specialists on the chemistry of hydraulic cements, on proportioning concrete, and on the effect of sea water. But the book aims at meeting the needs not only of the civil engineer and large contractor but of those seeking simple directions as to the exact procedure in laying a small quantity of concrete. The early part of the book treats the subject thus, giving an elementary outline for the inexperienced, the heads of which are afterwards treated in detail for more scientific or extensive users and for those who wish to make an exact study of methods and principles in using cement and to understand how it is made. The first chapter, on Concrete Data, is arranged to be both an index and a summary of the contents of the book. The subject matter in this chapter is arranged in sections with descriptive heads and the caption words underneath have not only a page reference to the place where the matter in question is treated, but a short summary of the information that will be found there. For instance under the head of PROPERTIES OF SAND AND SCREENINGS there is the item "COARSE SAND requires less water than fine sand, and when mixed with cement makes a denser mortar, p. 216"; and a reference to the page explains the matter fully. This helps very much the usefulness of the book. There is a chapter on reinforced concrete and examples of its practice; indeed plain and reinforced concrete seem hardly to be entirely separable now. The book has numerous illustrations.

EASY LESSONS IN THE ART OF PRACTICAL WOOD CARVING, BY FRED. T. HODGSON. PUBLISHED BY FREDERICK J. DRAKE & CO., CHICAGO. CLOTH $1.50.

The title of this describes very well its purpose and range. It is a plain and practical help to doing carver's work. It is Mr. Hodgson's forte to shed the light of common sense upon building operations. In this case he does the same for carving. He disclaims the possibility of imparting "feeling", or even great skill by means of a book. The first is an inborn quality; the latter is a matter of practice. But the use of carver's tools and appliances, and the care of them, and such knowledge of the qualities of the material as is necessary, can be taught, nor is there any difficulty in understanding the basis of decorative design. These [illegible] and lucidly written and copiously illustrated, and the beginner who reads it in conjunction with practice will acquire a sensible and and efficient attitude of mind to-

The modern idea of a garden is well expressed in the following description, by Oliver Bunce. "My house stands among trees and flowers, but there is not one distinctive flower-bed in all its grounds." Shrubs and flowers together—the shade of the one a background for the color of the other—is the pleasantest arrangement, and most like the combinations that attract us in nature. This is a fair mean between the hard artificiality of the formal garden and the landscape gardener's imitation of natural scenes.

LIGHTNING RESEARCH.

A committee of members of the Royal Institute of British Architects and of the Surveyors' Institute, appointed nearly five years ago have, after conference with experts, presented a report which has just been published. The new point at the bottom of their recommendations, as stated in a preface by Sir Oliver Lodge, is the fact that the electrical energy stored in dangerous amount between the earth and the clouds should be dissipated not, as was formerly thought, as quickly as possible, but as quietly as possible. Sir Oliver Lodge says: "These are the two points of novelty. (1) The possible occurrence of a totally unprepared for and sudden flash in previously unstrained air, by reasons of overflow from a discharge initiated elsewhere. What is called the B spark, occurring as the secondary result of an A spark. (2) The effect of electrical inertia or momentum, so that the discharge is not a simple leak or flow in one direction, but a violent oscillation and splash or impulsive rush, much more like an explosion, and occurring in all directions at once, without much regard to the path which had been provided for it; no more regard, in fact, than is required to enable the greater part of it to take the good conductors, and to prevent any part of it from being able to enter a perfectly inclosed metallic building." The practical inference from this fact is that a larger area of protection is necessary and the committee recommend, in the first place, a pair of vertical conductors, instead of one, on a tower or spire, and, secondly, a horizontal conductor connected them, which should encircle the building, throwing up points at intervals and receiving the ends of rods erected on minor vertical projections of the building. Thus the energy of the dispersed B flash may be quietly dissipated. The best material for conductors is iron, which seems to be peculiarly effective in dissipating electrical energy; but it is difficult to keep iron unoxidized and clean in smoky towns. Copper is therefore good for inaccessible positions; and it is good for main conductors. Steel roofs and steel frame buildings have no record of damage against them and are apparently self-protecting; but it ought to be better to connect the columns of a steel frame with the earth than to leave them to finish on a stone foundation. In the suggestions of the committee, given below, clause 6 offers a suggestion in this respect. The suggestions may be summarized, in fact, under two heads: (1) That the highest points of the building should have one or more vertical lightning rods projecting from them and carried to the earth. (2) That all exposed exterior metal, should be connected with a vertical rod. There is also a third suggestion for the interior, to ground the gas service [illegible]

1. Two main lightning rods, one on each side, should be provided, extending from the top of each tower, spire, or high chimney stack by the most direct course to earth.

2. Horizontal conductors should connect all the vertical rods (a) along the ridge, or any other suitable position on the roof; (b) at or near the ground line.

3. The upper horizontal conductor should be fitted with spikes or points at intervals of 20 ft. or 30 ft.

4. Short vertical rods should be erected along minor pinnacles and connected with the upper horizontal conductor.

5. All roof metals, such as finials, ridging, rainwater and ventilating pipes, metal cowls, lead flushing, gutters, etc., should be connected to the horizontal conductors.

6. All large masses of metal to the building should be connected to earth directly or by means of the lower horizontal conductor.

7. Where roofs are partially or wholly metal-lined they should be connected to earth by means of vertical rods at several points.

8. Gas-pipes should be kept as far away as possible from the positions occupied by lightning-conductors, and as an additional protection the service-mains to the gas-meter should be metallically connected with house services leading from the meter.

INVESTIGATIONS FOR THE EMPROVED USE OF CONCRETE.

I. THE PREVENTION OF EFFLORESCENCE IN CONCRETE BLOCKS.

Mr. Beaumont Jarvis, Toronto, has been trying to get rid of efflorescence from concrete for facing by washing the cement before it is mixed with the aggregate. As the components of efflorescence are obviously soluble, this seemed a feasible way to separate them from the cement. In order to test the effectiveness of the method of proceeding and also to find out how the strength of the cement is affected by it, he put the matter in the hands of Mr. J. C. Johnston, Analyst for the Municipality of Toronto, whose report Mr. Jarvis kindly allows us to publish. It is as follows:

TORONTO, NOV. 3RD, 1905.

BEAUMONT JARVIS, Esq., Architect,
McKinnon Building, Toronto.

DEAR SIR:—I beg to hand you herewith my report of the recent tests that, acting under your instructions, I have made.

The object of these tests was to ascertain, if possible, a method of manipulating the cement to be used in the manufacture of concrete blocks; so that when in use the concrete block would show no appearance of that white surface deposit that has been so troublesome.

Throughout the entire tests Alsen's German Portland Cement has been used. This cement has the following chemical analysis:—

Silica	22.44%
Alumina } Ironoxide }	8.95%
Lime	61.44%
Magnesia	2.45%
Anhydrous Sulphuric Acid	1.17%
Alkalies	0.82%
Carbon Dioxide	1.45%

A physical test of the Cement resulted as follows:—

Specific Gravity	3.09%
Fineness, Residue on No. 100 sieve.	8.50%
Hot Test—Sound (i.e. no free lime in the cement.)	
Setting Initial	175 Minutes.
" Final	355 "

Tensile Strength	Neat	3 Sand to 1 Cement
24 hours	277 lbs. per sq. in.	63 lbs. per sq. in.
7 days	610 " "	178 " "

Water used in mixing:—

Neat	24.5%
3—1	10.0%

Both the chemical analysis and the physical examination show that the cement is first-class.

Now the first step was to make an analysis of the white deposit taken from the surface of a concrete block. The result of this operation was that I found the deposit to be composed of:—

Silica	6.74%
Alumina and Iron Oxide	2.20%
Lime	10.15%
Magnesia	.96%
Anhydrous Sulphuric Acid	6.45%
[illegible]	[illegible]
	50.01%

Leaving a balance of 41% which on analysis proved to be largely soda compound. This would, in the deposit, be combined with the carbon dioxide in the form of sodium carbonate, to the extent of 70% of the total.

The above analysis shows conclusively that the deposit is nearly all sodium carbonate with a small percentage of a sulphur compound, very probably calcium sulphate, as this substance is often added to a cement, in manufacture, to make it slow setting. The Silica, Iron Oxide, Alumina, Lime and Magnesia, in all probability has been in the small quantity of cement that was scraped from the concrete block while sampling.

Now after treating the cement in the manner you suggested, and collecting the scum that appeared on the surface of the water and also the surplus water, I find that the scum is composed of:

Silica	19.45%
Alumina and Iron Oxide	6.50%
Lime	47.94%
Anhydrous Sulphuric Acid	4.48%
Magnesia	2.08%
Carbon Dioxide	16.73%
	97.19%

The low percentage of lime, with the high percentage of carbon dioxide indicates, to my mind, that the fine underburned particles of cement rise during the manipulation and with, of course, a large proportion of cement form a scum. In this scum is a considerable quantity of sulphuric acid. This scum weighs only a small fraction of one per cent. of the total cement used.

The analysis of the surplus water disclosed the fact that the objectionable sodium carbonate was in solution. In fact from 800 grains of cement 3.563 grains of sodium carbonate was obtained or nearly 0.5%.

An analysis of the cement in the first place showed alkalies (or sodium oxide and potassium oxide) 0.82%. Now assuming that 3/5 of this 0.82% or about 0.5% of the cement, is sodium oxide, we can have 0.8% sodium carbonate, in other words there is only enough sodium in the cement to make 0.8% sodium carbonate. We have removed nearly 0.5% by our treatment and as some of the sodium must be intimately combined with the cement, there cannot, in my opinion, be enough left to cause an appearance of the white surface deposit.

A test made of the cement, after the treatment, shows that the strength in a few days is considerably increased. The following is the result of the test:—

Tensile Strength....3 (sand) to 1 (cement)	
24 hours	41 pds. per sq. in.
4 days	162 " " " "
7 days	215 " " " "

Referring to the test of the cement before treatment, you will see that the tensile strength 3 to 1 was

for 24 hours	63 pounds per sq. in.
for 7 days	178 " " " "

or after treatment, to remove sodium carbonate, the strength of the 3 to 1 mortar was in 24 hours 35% lower than when not treated, due entirely to the fact that a large percentage of water was of necessity used in mixing, and when such is the case, the hardening is more gradual than when mixed drier. In 7 days, however, it was, as shown by the above, 21% higher than in the ordinary test.

These tests will be carried on up to three months so as to be sure that the increase is not only temporary.

The above analysis and figures give convincing proof, in my opinion, that your treatment not only gets rid of the objectionable sodium carbonate, the cause of the white surface deposit, but also increases the strength of the stone.

Yours respectfully,
J. C. JOHNSTON, Analyst.

II.—COARSE AND FINE SCREENING.

Mr. Jarvis has given us also a report, made to him by Mr. Johnston, of a test to establish the relative values of aggregate with and without dust. The result of the tests is to establish in every case greater strength for the mortar which included the dust.

REPORT.

Date.	No.	1 Part Lehigh Cement with 3 Parts of	Tensile Strength (pds. per sq. in.) 7 days.	
			376	
			353	
			—	Average 360
Oct. 2nd	2.	Limestone retained on No. 100 sieve (without fine powder)	340	
			349	
			—	Average 343
Sept. 30th	3.	Limestone that passes No. 8 sieve	404	
			396	
			—	Average 400
Sept. 30th	4.	Limestone that passes No. 6 sieve and is retained on No. 100 sieve (i. e. without powder)	380	
			406	
			370	
			367	
			—	Average 381
Sept. 30th	5.	Limestone that passes No. 8 sieve	348	
			369	
			350	
			373	
			—	Average 360
Sept. 30th	6.	Limestone that passes No. 8 sieve and is retained on No. 100 sieve (i. e. without powder)	375	
			346	
			35	
			352	
			—	Average 336
Oct. 2nd	7.	Limestone that passes No. 10 sieve	352	
			322	
			362	
			321	
			—	Average 339
Oct. 2nd	8.	Limestone that passes No. 10 sieve and is retained on No. 100 sieve (i. e. without powder)	326	
			298	
			283	
			274	
			—	Average 295
Oct. 2nd	9.	Lake sand (Sand & Dredging Co.)	280	
			280	
			258	
			261	
			—	Average 270
Oct. 2nd	10.	Standard quartz sand	192	
			189	
			185	
			197	
			—	Average 191
Oct. 15th	11.	Limestone dust (i.e. what passes No. 100 sieve)	191	
			190	
			205	
			214	
			—	Average 202

J. C. JOHNSTON.

SKY SCRAPER CHURCHES.

The Broadway Tabernacle of New York, an historic Congregational church, originally situated down town, moved in 1859 to a site on the corner of Sixth Avenue and 34th Street, which cost them $62,500. This property was sold in 1902 for $1,300,000. The church has therefore money, not exactly to burn but for building fireproof. It has built an eight storey building which contains many other things besides a hall for preaching in. The accommodation begins, in the basement, with the social hall and accompanying kitchen and pantry service. It is not only evening gatherings that this department is expected to serve; but, in order to facilitate the various kinds of work that go on in the daytime, luncheons must be provided for the workers.

The ground floor, (which in design appears to serve the function of a basement to the auditorium or principal floor above,) contains a hall called Pilgrim Hall, to seat 600 people. This hall is to have a stage, with footlights, curtain, dressing rooms and all regular requirements of the theatre, including private boxes. The purpose of the hall is not for a dramatic department of the church, but to lend a hand to causes that should be heard, by supplying at a nominal charge a place for their hearing. On this floor also appears to be the prayer meeting room.

The principal floor contains the auditorium, which is much like other auditoriums, and has a small chapel adjacent, for weddings and small gatherings.

Above the auditorium floor, or properly speaking floors, for there are galleries, is a Sunday School consisting of a two-storey hall with two storeys of class rooms, with movable fronts, opening upon it.

Above this again are a floor of women's parlours; next a floor of men's parlours; next the administration floor, with the pastors study, office and waiting room, and rooms for his various assistants; and, at the top is the sexton's dwelling. It is proposed to add, some day, two floors for a museum.

The Baptists of Cleveland, or at any rate the Rev. Charles Eaton of that denomination, have a project for a building still higher, (reaching 12 storeys,) and comprehensive, (as it will include sleeping accommodation.) There will be an auditorium in the same position as that in the Broadway Tabernacle, occupying the first and second floors, (or, as Dr. Eaton would call, it the second and third) and approached by a grand staircase; but the rest of the building will be a

sort of home, intended to ameliorate down-town social conditions. The ground floor will contain reading-rooms, libraries and rest rooms, and will be open to every one who has no home. On the upper floors there will be provision made for games, to attract street urchins from the slums ; and there will be dining rooms and sleeping rooms. "Among churches" Dr. Eaton says "it will be unique, for it will be the outgrowth of our own experience." (He means unique as the outgrowth of unique experience. Other churches try to meet their experience.) "Continually," he adds, "we are turning hundreds of people from our doors."

A PERFECT SEWERAGE SYSTEM FOR RURAL HOMES, SCHOOLS AND FACTORIES.

M. J. Quinn, Provincial Mechanical Superintendent.

It is perhaps no exaggeration to say that, having regard to the frequency with which it comes up for consideration, and many other circumstances, the question of properly disposing of sewerage is one of the most important matters with which the health authorities throughout the country have to deal, and yet it is a remarkable fact that in these days of popular education, when the people enjoy the benefit of free literature and lectures on fruit growing, dairying, domestic science, etc., that a knowledge of so important a subject, and one so closely allied to their physical and moral welfare is confined to a limited number.

True a vast amount of experimenting has been done during recent years, and the matter has received a great deal of attention from scientific men, the results of whose labors have been freely discussed at medical conventions and reported in Medical Journals, but the valuable information so obtained has not reached the great mass of the people at all.

In the matter of public sanitation, the question of disposing of sewage in small towns and villages as well as in less populated districts, where by reason of its great cost a general system of sewerage is impossible, is daily becoming of greater importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the sceptic tank system, and I believe that nearly all who have studied

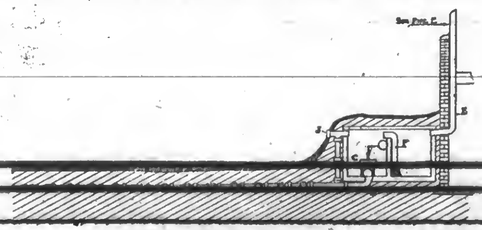


Fig. 1.

it is conceded that it is of [illegible] most natural, most scientific, simple and economical system in use to-day, and speaking from a personal knowledge of scores of the systems, I am in a position to say that it is worthy of all the good things that are said of it.

earth— or top soil,—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and that these bacteria, not only through their action remove and destroy the dangerous properties of such waste matter but actually convert them into plant food, which being taken up by the vegetation is again consumed for the sustenance of life. Pasteur divided these microbes into two classes, viz:—anerobes, or those which lived apart from air, or derived their oxygen from decaying compounds, and acrobes, or those which require plenty of fresh air for their development, and as both classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deep in the earth, as for instance in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist; it may pass down deeper in a putrid state, and, finding its way in the water supply, not unfrequently results in an outbreak of typhoid fever or some intestinal disease.

The two classes of microbes referred to, have properties somewhat differing from each other, but the net

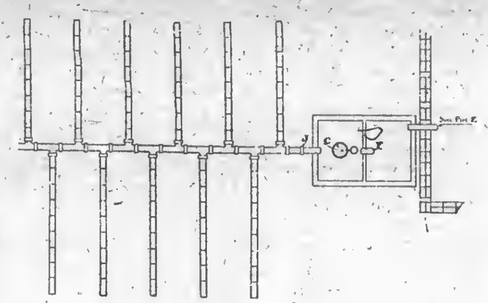


Fig. 2.

result of their work under proper conditions is the breaking down of the solid matter in the sewage, the disintegrating of its constituents and the conversion of the whole into liquids and gases, in which form it leaves the septic tank, the former to be distributed under the suface of the earth, where, by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates which are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described.

With this brief reference then, to the principles which underlie what is conceded to be a most efficient system for the disposal of sewage, I propose to indicate how it should be constructed; and in order that I may the more readily make myself plain, I have drawn for your inspection a number of diagrams which I trust will accomplish the desired result.

In fig. 1 is shown a section of a complete system built on level ground, with the tank placed close to the wall of the building,—where in fact the large majority of those now in use are located.

The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture.

It will be noticed that the tank is divided into two compartments, an over-flow pipe "F" being built into the dividing wall, the mouth of the said overflow being within seven or eight inches of the bottom of the tank,

an ordinary nail, the mesh of said screen not exceeding three-quarters of an inch.

The main soil pipe is represented by "E" and should be directly connected with the closet, bath, sink, etc. It extends from the same compartment in which the overflow is placed to a point two or three feet above the roof, said pipe acting not only as a conductor of sewage to the tank, but also as a channel by which any gases in excess of those in solution, may pass out to the atmosphere at a height that renders it impossible for them to inconvenience the occupants of the building.

"J" in the second compartment admits fresh air, which passes freely over the centre partition,—spaces being left in the top of the latter for the purpose,—and up through the soil pipe to the roof.

*From the Sanitary Journal of the Provincial Board of Healthof Ontario.

In the centre of the second compartment is placed an automatic valve "C," the said valve is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

Fig. 2 shows a plan of the whole system and illus-

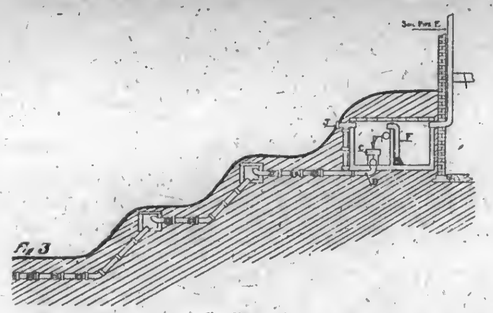


Fig. 3.

trates one way in which the tile may be laid, though, as will be manifest, they would do equally well if all laid in one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil.

The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

Briefly then, the operation of the system is as follows:

The sewage from the building enters through soil pipe "E", filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through overflow "F" which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface.

When the liquid has risen in the second compartment to the height at which the [illegible] float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before it again discharges.

To prevent the gases of decomposition escaping

be covered first with rough plank and then with five or six inches of earth, which in turn, if desired, may be sodded over.

In figuring out the size of tank necessary, the following may be taken as a safe rule, viz:—for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewerage is to be treated, one-third less space will be sufficient ,and for every cubic foot in one compartment (or one half the tank), lay thirteen feet of four-inch field tile.

It will be obvious that, as in the case of ordinary stable manure,; human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, with the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, I would refer you to fig. 3 which shews a number of terraces each receiving a portion of the effluent from the tank.

It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the obvious result of which is that all the field tiles at that level must fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on tor any number of terraces, and as will be apparent, the sewage passing into the the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shews the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank as shown will not have any injurious effect on the latter.

In answer to a question which arises in the minds of most people I may say it will not freeze in winter, even when the frost penetrates the ground for several feet everywhere except where the tiles are laid, and as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden.

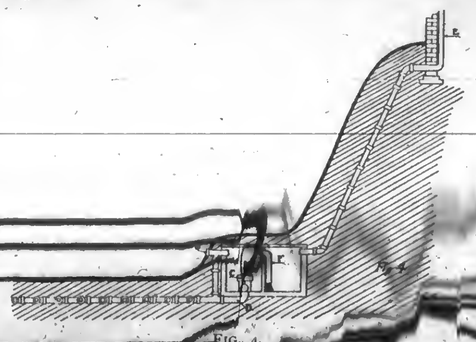


Fig. 4.

In conclusion I would simply refer to a few of the principal points which should be kept in mind in constructing such a system, viz:—

[illegible] with a few inches of earth, to prevent the escape of gases except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air is left in the top of the centre partition, and finally take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Carpenter":—Is there a simple method of laying out lines on a timber so that an octagon section of the timber can be formed by the use of the Steel Square?

Ans.—This is a simple matter; suppose for example, we have a square stick that it is desired to make octagon in cross section irrespective of what the face may be; but to be definite, we will say 3 inches. Place the

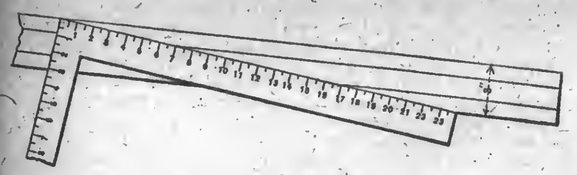


Fig. A.

steel square diagonally across the face and mark where the points of 7 inches and 17 inches come, as indicated in the sketch submitted, at Fig. A. The distance from the edge to these points is the distance to which to set the thumb gauge to scribe the lines.

From "Factory Hand":—I have been told that there is a method employed in some woodworking factories by which a rope or spiral moulding can be made on an ordinary sticker by making use of a few simple home made devices. Will you kindly publish a description of these devices, or refer me to some work where I can obtain the required information and oblige?

Ans.—The following description of this device, which was sent by a correspondent to The Woodworker

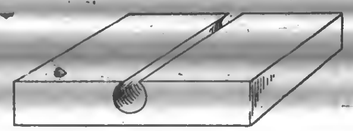


Fig. 1.

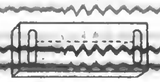


Fig. 2.

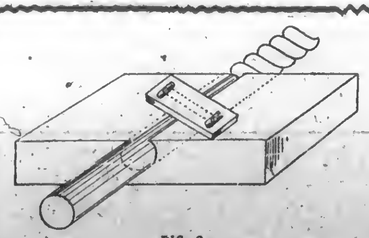


Fig. 3.

some years ago seems to cover the ground asked for by our correspondent. First, make stock to be worked round say ⅞. I have a chuck for this purpose that works from ¼ to ¾ inch and one that cuts from ⅞ to 1¾ a nice lathe tool—both made in Battle Creek, Mich. Next make a wooden table on sticker over the top head, with an opening for the knives. Then take a block of wood, say 1½ thick by 6 inches wide, 16 or 18 inches long, and bore a ⅞ hole to one side and through the block, letting the bit cut out about ⅛ of an inch, as in Fig. 1. Fasten this block on the table over the knives, so a rod in the block will lay at an angle of about 45 degrees to the head. Then run bed of machine up until knife will cut a full head or beads. The best to experiment on will be the 3 strand when cut with a common stocker knife with three heads ½ inch or thereabouts, with the centre bead dropped back

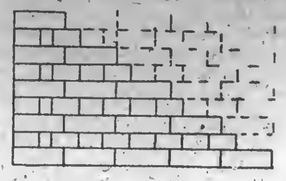


Fig. 4.

a little. Next, the arrangement for twisting the stock through the block: Take a block of hard wood 4 inches wide, 8 inches long, ⅞ inch thick. Slot each end about two inches. Take two thin pieces of steel—old jig saw blades will do. Make them sharp on the back and drive them into the block lengthwise in saw kerfs, about ¼ inch apart—see Fig. 2. The object of the slots is for adjustment for making the beads intersect. Fig. 3 shows the twister in position. The stock is twisted through by hand. In case the knives do not cut out feed marks, move the twister until they do. There is a machine made in Battle Creek for twisting the stock either by hand or power which costs about 3$ or 4$, but a person can get along with twister I have decribed if he doesn't want to make moulding for market, but only for his own use. The tighter you have the twister the more positive the feed, and, as it will turn pretty hard, one can use a block to turn with. Drop out one or two beads and run some; you will be surprised at the result O.G.P.

From "Young Bricklayer":—In your May number I notice you make mention of laying bricks in part, as it were, and you use the expression "rake up", will you kindly explain what is meant by this term?

Ans.—"Raking up" or more properly "raking-back" is the term used by bricklayers when running up a wall where portions of it is built higher than other portions but which is to be finished up afterwards before the wall is levelled off on top. Fig. 4. shows

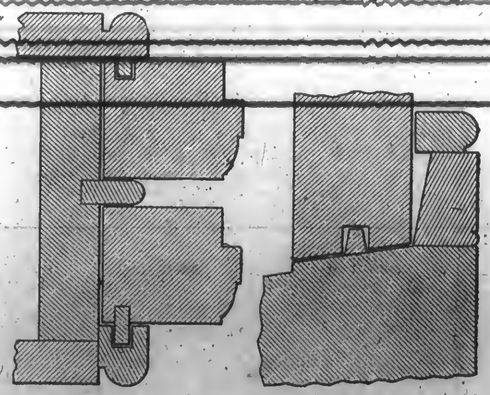


Fig. 5.

Fig. 6.

what is meant by "raking up". It will be seen that the bricks are so arranged that the work to be added, as seen by the dotted lines, will bond with it and keep the lines of joints in a horizontal position. Raking-back should be avoided when there is no valid reason for doing it, and when it becomes a necessity it should not remain more than a day or two before the remainder of the wall is built up to the level or above the top brick of the "rake up".

From "Builder":—Out here on the shores of Lake Huron, we have much wind, and in the winter these winds are chiefly from the north and northwest, and it is almost impossible to prevent drafts from getting in around windows and doors, particularly about sashes, can you suggest any way to overcome in some degree, this fault?

Ans.—In all badly fitting windows the worst draft will be found at the sides. To remedy this take out both sash and run a groove up each stile 1/4 inch wide and the same in depth. The grooves must be on the outside of the top sash and on the inside of the bottom one. A strip of hard wood 3-16 inch square may now be tacked on the inside of the projecting part of the outside lining of the sash frame against which the top sash runs, so that, when the sash is in position, these strips will fit easily in the grooves. The strips must run from top to bottom of the frame, and if fixed straight and true they will in no wise interfere with the working of the sash, but will effectually stop all wind and wet from finding a way through. This finishes the arrangement for the top sash. The bottom one is done slightly different. In the grooves already made on the inside face of the stiles must be fitted a hardwood tongue, which can be either nailed or glued in. These tongues should project beyond the face of sash fully 1/4 inch and in the inside edge of the staff beads must be run a groove so that the tongues will slide easily in them. This will be found to act as effectually for the bottom sash as the former does for the top, and no draft will be felt at the sides of the window after. Some care will be required in moving and replacing the staff beads to rehang when fitted with these tongues but if the bottom sash is run up to the top and the bead removed bottom end first, it can be managed easily enough removed and replaced just as easily by following the same procedure. The above method will be readily understood by referring to Fig. 5, which shows the horizontal section of a sash frame fitted with tongues as described. Should the wind come in at the bottom of a window, an easy method is shown in Fig. 6. It is simply a strip nailed on to the sill and a groove plowed in the bottom rail of sash to fit over it. There is no need for the sill to be grooved, as is sometimes done, as it only makes a receptacle for the wet and hastens the decay of the sill, whereas if the strip is simply nailed on the wet is only on the surface. Nothing is required at the top of the frame, as any fresh air which enters there can safely be considered as ventilation, and will do no harm, but it is often the case that the meeting rails fit badly together so as to cause drafts. In such a case plane off the bevel, or rebate, as the case may be, where the two meeting rails come together, and nail a strip the thickness of the parting beads and half the thickness of meeting rails in width on each of the meeting rails flush with the top end bottom of the bottom and top sash respectively. These two strips will make a close joint, and if the fastner is put on so as to pull the two sash together tightly the entrance of fresh air will be effectually stopped at this point.

From "Bricklayer":—Is there any way to give brick the red color of those burned from clay rich in oxide of iron? Would it probably be too expensive to mix ground uncalcined oxide with the clay? Mixing ordinary black loam with clay affects the color to some extent, but is apt to injure the strength of the brick. Putting salt in the fire near the close of a burning to a limited extent gives a dark red to the brick, but this is apt to take place only where the brick are subject to a great heat. What is the chemical action of this last?

Ans.—We very much doubt of your obtaining any practical success by the use of snch a mixture as you suggest owing to the expense and difficulty of securing a homogeneous mixture. As regards the chemistry of the salt process, it may operate as a flux, fusing with the light colored silicious portions into a colorless glass and not affecting the iron oxide, or it may even volatilize some of the alumina as chloride. It is not easy to state its action without examination or analysis.

From "Apprentice":—Please explain the meaning of the term "dinged" as applied to the internal common brickwork that is pointed with a flat joint?

Ans.—There are two kinds of dinging, one is axing old bricks to look like new, and the other is rubbing over the walls, new or old, with a piece of colored brick in order to give the same general tint throughout. The latter method is generally adopted before tuck pointing in order to hide the original mortar.

GARDEN ARCHITECTURE.

Summing up his own views on this subject in a paper read at a meeting of the R.I.B.A., Mr. Mervyn Macartney said that if he was called on to lay out an extensive garden site in England, he should avoid geometrical beds—those unhappy compositions with shapes like tadpoles, kidneys, etc. Neither should he embark on topiary work on any great scale. Hedges of yew, privet, hornbeam, etc., were charming adjuncts to a garden, and here and there trimmed shrubs were useful; but he could not admire Levens, Elvaston, or Blickling. As our country is the most beautiful in the world, he would take advantage of every opportunity that offered of incorporating it into his scheme. Supposing he had not merely the laying out of the site of a garden, but also the choice of its position, he should not choose a lofty hill with a panoramic view. From the result of his experience, he was certain that this was a mistake: foreground and middle and distance was wanted—human interest. Avenues of trees bordering a long stretch of water, as seen at Fontainebleau and Hampton Court, pleased him more than the terraces and beds of Versailles. One could not dissever oneself from one's climate; and though he vastly admired the superb cypress, ilex, and arbutus groves of Italy, he was as fond of our deciduous trees, even in winter. He did not care very much for the appearance of evergreens in England, except the yew and holly: their foliage had a hard metallic look that seemed to indicate that they were not happy in their surroundings. To his mind the detail, invented and perfected in this country, of terrace walks, balustrades, etc., was perferable to that of any other country. Further, he would avoid marble, as looking too white and staring. A very fair surface can be got in concrete, provided too much sand and water is not used, and that it is not rammed down too well; otherwise, the sand and cement will come to the surface and show the lines of the plank strutting. Dwarf walls of brick laid dry assume an appearance of age very rapidly. We had nothing to learn now from foreign examples, and we had enough in this country to guide us, the best being those which were not slavish copies of other lands.—*The Architects Magazine.*

A UTOPIAN HOTEL BEDROOM.

A writer in the *County Gentleman* has a good deal to say about Mr. H. G. Wells' "Utopia" and its conceptions of improvement in social affairs. The only part of the article that concerns our purpose is the description of a bedroom in a hotel, which is as follows :—

"A cake of soap drops out of a store machine on the turn of a handle, and when you have done with it, you drop that and your soiled towels and so forth, which also are given you by machines, into a little box, through the bottom of which they drop at once, and sail down a smooth shaft. A little notice tells you the price of your room, and you gather the price is doubled if you do not leave the toilette as you found it. Beside the bed, and to be lit at night by a handy switch over the pillow, is a little clock, its face flush with the wall. The room has no corners to gather dirt, wall meets floor with a gentle curve, and the apartment could be swept out effectually by a few strokes of a mechanical sweeper. The door frames and window frames are of metal, rounded and impervious to draught. You are politely requested to turn a handle at the foot of your bed before leaving the room, and forthwith the frame turns up into a vertical position, and the bedclothes hang airing. You stand at the doorway, and realise that there remains not a minute's work for anyone to do. Memories of the fœtid disorder of many an earthly bedroom after a night's use float across your mind."

The writer of the article comments :—

"Would this kind of life, really, lead to happiness? If simplicity means happiness, is this simple? Is it not hatefully complex? And it is only one tiny picture—Mr. Wells's ideal bedroom."

He seems himself to have a lingering longing for "Alan Breck's bed in the moss-hags." And so have we all. But in a hotel we want cleanness first, and sanitary ugliness has a sort of attractiveness. But some one else may turn the handles.

THE NEW YORK BUILDING FAILURES.

The committee appointed to investigate the causes of these failures has reported. The failures occurring on the first warm day of spring, and all on the same day, were obviously caused immediately by thaw, and were generally supposed to be entirely due to building in freezing weather. This condition appears however to have been added to other bad conditions. The report reads :—

From our investigation we conclude that in every case the collapse or the partial destruction of these buildings was directly due to the failure of their foundation walls.

We found these walls full of voids, built of irregular and undersized stone, improperly bonded and imperfectly bedded. The mortar used was of an inferior quality and improperly mixed. Both the materials and the workmanship were in flagrant violation of Section 26 of the Building Code.

Although the sudden change in temperature which occurred on the night of March 18 may have contributed to the failure of the stone foundation walls in these various buildings, it is, nevertheless, a fact that these walls were of such inferior workmanship and materials as to make them insufficient to sustain with safety at any time the superimposed loads.

Our inspection revealed many violations of the Building Code, which, while not contributory to the destruction of the buildings, were in themselves a distinct menace to their permanency, inasmuch as they eliminated or reduced the factors of safety which the code provides.

Our comparison of the approved plans with the buildings showed that the corrections and amendments required by the Bureau of Buildings, as a prerequisite for the issuing of the permits, were generally disregarded in construction, although consented to in writing by the applicants in their desire to secure such permits. The work of the engineering staff of the Bureau of Buildings was, therefore, completely nullified.

The applications relating to the above mentioned buildings showed that in only one case was the architect of record to superintend the construction. In no case was the name of the builder stated. These omissions left in question the competency of those who were to supervise and the character of the contractors who might be selected to erect the buildings.

We can, therefore, only conclude that these buildings were erected without proper supervision, under inefficient inspection and by incompetent contractors; that the provisions of the Building Code were generally disregarded and that a very low standard of work is typical in this class of buildings.

In further compliance with your request and in view of these facts, we submit for your earnest consideration the following recommendations :

1. Architects should be required by law to supervise the construction of buildings for which they furnish plans.

2. A person before being allowed to practice as an architect should hold a diploma from some institution of learning or from a recognized board to be created hereafter. The personnel of this board and the methods of its operation should be left to a commission composed of representatives of the various architectural associations and members prominent in that profession.

3. A register of those authorized to practice architecture should be kept by the Bureau of Buildings, and permits for the erection or alteration of buildings should be issued by the superintendent of buildings only to those so registered.

4. All contractors for mason work or structural steel work should be licensed. The co-operation of the recognized organizations in these trades should be sought in the establishment of such board or bureau.

5. It shall be unlawful to permit the building of mason work or the erection of structural iron work by persons not so licensed.

The substance of these recommendations enacted into law would make the recurrence of similar accidents practically impossible, as such enactments would secure competent architectural supervision and capable contractors for all classes of building operations. The rigid, conscientious inspection of work in progress, which the Bureau of Buildings has failed to secure in these cases, is then a matter of secondary importance.

The intention is evidently to establish by law such conditions of good building that the least possible dependence need be placed on official inspection.

MOVING PLATFORM SUBWAY.

The current issue of the Scientific American devotes a considerable portion of its space to the discussion of the moving platform subway to be constructed in New York, and summarizes in a leading article the evidence given by Mr. Stillwell, the electrical expert of the Interurban Railroad Company, in which he showed the great economic advantage possessed by the moving platform over the electric-car system for city transportation. "It seems," states the Scientific American, "in the first place, that the moving platform has a great advantage in respect of the dead weight carried per passenger; for whereas in the local subway service 1,241lb. of dead weight must be carried for each seat provided, and in the Manhattan six-car local service 790lb. per seat, in the case of the moving platform the dead weight will amount to only 437lb. per seat, or one-third of what it is in case of the subway. There is, moreover, a large saving of energy resulting from the fact that the moving platform does not stop at stations. In the local service of the subway over two-thirds of the energy supplied to the cars is dissipated in braking. In other words, if the cars moved at uniform speed and never stopped at stations it would require only one-third of the power plant to keep the whole system in operation. A comparison between the power required to move trains and to move the platform shows that the Manhattan Elevated cars require at the power house 30 kilowatts per car, and subway cars require, at equal speed, about 50 kilowatts per car. In the case of the subway the energy required is practically 1 kilowatt per seated passenger; that is to say, 10 kilowatts at the power house are required to transport ten seated passengers in the subway. Estimating the rolling friction of the platform at about 6lb. per ton Mr. Stillwell estimates that 10 kilowatts, in [illegible] ing, as in the case of the subway, ten passengers would be [illegible] the moving platform. This great difference of 1 to 26 is due to the small dead load, the absence of stopping, and to the fact that the rolling friction per ton is very much less. It has been charged against the moving platform that the speed, 9 miles per hour, is low, but it was shown by Mr. Stillwell, and endorsed by Mr. Stuyvesant Fish, that, because of the frequent stops, say on the local elevated or subway trains, and of the great delay at stations in rush hours due to insufficient means of ingress and egress to and from the cars, the higher speed of the elevated and subway trains between stops is brought down if the stops be included, to an average speed of 9.67 miles per hour, which is only a little over one-half mile per hour greater than that of the platform which maintains its 9 mile an hour continuously." The carrying capacity of the moving platform is stated to be vastly greater than a four-line system of electric cars.—*Times Engineering Supplement.*

HIS UNUSUAL CURIOSITY.

An East End resident who had considerable business with plumbers, carpenters, brickmasons and artizans generally in the construction of a new home finally engaged a painter. His wife had been urging him to hurry the work on the house, and had planned a reception for its opening day.

"Yes, sir," said the painter. I can promise to have your house finished in two weeks."

"Yes, but," said the owner anxiously, "that isn't the point."

"Then, what is ?"

"I want to know how long it is going to take you."—Duluth News-Tribune.

MONTREAL NOTES.

In all directions there continues to be great increase in the volume of work being done in the building world of Montreal. Besides the large apartment houses in the neighborhood of Sherbrooke street—the "New Sherbrooke" and the "Grosvenor", both now well under way, and the "Hampton Court" apartments in Mountain street—a great deal is being done to meet the pressing demand for residences of all sorts and grades. As noted in former issues a great number of Banks are erecting branches wherever customers are likely to be attracted, others are vying with one another in offering all sorts of conveniences to their clientèles.

In another sphere, well over a million dollars is being spent on various projects of the Roman Catholic church. The Notre Dame Hospital, now well advanced, will cost, when complete, probably about $160,000. The "Maison-Mère" of the Sisters of the Congregation de Notre Dame, which is just being commenced, is estimated to cost $800,000. This is to be built on the south side of Sherbrooke street, near the head of Atwater avenue, a building of grey pressed brick and Gray Canton sandstone, including a chapel to seat 1000 persons which forms the central feature of the design. The same firm of Architects, Messrs. Marchand & Haskell, have also designed the Parish Church of St. Cunegonde now being built to replace the old one which was destroyed by fire.

For St. James's Church, at the corner of St. Denis street and St. Catherine street, a new Presbytery is projected, to cost about $32,000. The corner stone has been laid of the new Church of St. Agnes, for English-speaking Roman Catholics, at the corner of St. Denis street and Duluth avenue, of which Alphonse Piche is the architect. It is estimated to cost $25,000. The sum of $40,000 is to be spent on a four-storey school for the Congregation Ste. Croix de St. Laurent in Papineau avenue, and $25,000 on a Home for the Oblat Fathers in Panet street, near St. Rose.

Of a more commercial character, the largest project recently announced is the proposed new building of the Crédit Foncier, Franco-Canadian, to cost about $500,000. The site purchased for this building is that at the north-east corner of St. James street and Cote St. Lambert, measuring 98 feet by 82 and extending to Fortification Lane. It is proposed to erect the new building to a height of 132 feet, in ten stories. The ground floor will be occupied by the Crédit Foncier and the upper floors will be let as offices. Gray Canyon sandstone is to be employed for the facings. The Leurs Building in Bleury street is now completed externally and is being got ready for occupation. Farther up-town, in the south-east corner of Philip's square, the erection

Messrs. Edward & W. S. Maxwell. The upper stories of this building are to be faced with pressed sand brick trimmed with sandstone, somewhat of an experiment apparently.

The Bell Telephone Co. has arranged to build a new up-town exchange in the upper part of Mountain street—which it is expected to have running next summer—This being placed in a residential street, the design has been made to accord as much

Many changes in St. Catherine street are promised for the near future, but the only large work at present in progress is the Lindsay Building on the south side of the street a little west of Peel reet. There is little of this showing as yet but the work has commenced. The accompanying view of a portion of St. Catherine street, not far from the centre of its length, between Bleury street and Alexander street, shows a remnant of the old style. These buildings seem strangely out of place now, and they illustrate how rapid the development of this street has been. The street cars now race along in front of these shops at an average of one minute intervals day and night; but this is not done for such as these, and their days are numbered.

CONCORDIA SALUS.

UTILIZATION OF SKYSCAPER ROOFS.

While the tops of the skyscraper buildings would be fine launching places for aerial ships and flying machines, the record is still a blank regarding any utilization of the lofty spots for such a purpose. Thus far the inventors have sought out perches closer to the ground for their ambitious trial trips. Summer gardens, of the music hall sort and also for the private use of the occupants, are no new thing on the tops of the tall buildings, and it is also well known that the janitors of such buildings often utilize the roof space for kitchen gardens. The latest use of the roofs is as recreation grounds.

On top of one fifth avenue apartment house is a perfectly fitted up squash racquet court, for use in common by the tenants. The building is of wood, with a pitched roof lighted by glass windows, the play court being of the usual size and the building also containing a gallery for spectators. The small space needed for a squash court, approximately 35 × 16 feet, makes it an easy matter to find room for such a building on a roof, and there are several of them in use in the city close to the skyline. The courts are almost invariably enclosed by walls, and at an upper West Side apartment house the space is used for a lawn tennis court in summer and for ice skating in midwinter.

There is no better location possible for pigeon lofts, especially if working homers are kept, than the roof of such a building, and, as the Pigeon and Poultry Breeders' Association demonstrated during their show in Herald Square Hall, the location high in air is an excellent starting place for a distant flight. There are several skyscraper pigeon lofts in town, and at least one amateur fancier of show rabbits keeps his stock on such a roof.

A sporting utilization of another roof in midair is as

toys, or of the small sort at all, but, instead, the inmates are a collection of English bulldogs as well known as winners at the bench shows as any in the country. The kennel is a favorite meeting place of dog owners from out of town, especially when a dog show is on, and through its popularity in this way fulfills the place of a club for the amateurs who take delight in

When the elevator reaches its high-water mark in

to climb to gain the iron door that opens on the roof. As the stranger passes through the door and closes it behind him, he shuts out all that suggests city life, tall buildings, or whatever of the moil and toil of town existence may have dogged his steps thus far. He finds himself within a square of brick walls, such as they train fruits to grow on in England, and before him is a brick stable, with peaked roof and gilt weathervane, the duplicate of the carriage house of any detached suburban residence. He stands on clay soil and overhead is the blue sky, while the air is pure and as inspiriting as wine. It is like a clearing on a mountain top, and it would not be a surprise to see the tops of trees waving above the brick walls.

Inside the buildings are kennels arranged in double tiers, and fifty dogs may be kept there in comfort. On the walls are some photographs of notable winners for the kennel, and a frieze of sporting cuts. A great collection of blue ribbons and cups won at bench shows fills a glass case, and there are plenty of chairs to lounge on while the dogs are trotted out for inspection. The dogs thrive in the high location, and the only detail that

has required special thought is a machine on which they take walking exercise.

Manifestly, it would be a nuisance to take the dogs all the way down to the street for their walks, and if turned out on the roof they would do more sleeping than walking. The machine is merely a treadmill, such as dogs may often be seen working to furnish power for churns or small cider presses, and it is usually regulated so that 50 minutes of the machine is equal to a walk of a mile. Each dog, however, only gets 20 minutes on the treadmill a day and, besides, the walking exercise, the work is deemed good to square the shoulders and broaden the chests of the bulldogs. The dogs do their stint of work cheerfully and as though they liked it; in fact, they would much prefer to jog along on the machine than be shut up in their boxes. —*Architect and Builder's Journal.*

THE UNDERWRITERS' VIEW OF SOME FAILURES OF CONSTRUCTION.

In presenting to you the problem of this evening's talk I shall not try to touch upon every point in which construction may be said to have failed and the point-of-view is perhaps more correctly described as that of the insurance-engineer than that of underwriter. I should have chosen the term "insurance-engineer" rather than "underwriter" were it not for the fact that the insurance-engineer as a factor in our improved knowledge of construction is comparatively new, and that to most people, the term fire underwriter expresses more definitely the idea I am here to represent.

Of the types of construction which have been most prominent of late in the minds of the public there are two which probably are to-day better known than others. These are "mill" construction—so-called because it was supposed at least to be patterned on the standard of the best types of construction for manufacturing-plants—and the so-called "fireproof" construction.

Both of these types have been presented to the public as panaceas for the enormous fire-loss of this country (a destruction of property which is as truly a loss as if the money value represented by it had been thrown into the sea), and both of them have, in some forms of their development, failed entirely to prevent this loss.

The reasons for these failures are matters of careful study by active-minded men, trained for the purpose, and once understood will be as surely overcome as other engineering problems have been.

In the case of the so-called "mill" construction the error seems to have been two-fold: First, in the application of this construction to work for which it was not intended; and secondly, in a failure to carry out fully and properly the principles upon which this form of construction was based.

This type of building was originally designed to cover in and protect from the weather large manufacturing establishments in which strength not beauty was the leading requisite. It was designed to remedy certain defects which had appeared in the earlier type of building used for manufacturing purposes, such as concealed hollows in walls and floors, unduly combustible roofs and passages for fire, but not for firemen, from one part of the building to another; and it did overcome such difficulties to a very reasonable extent. It also improved the lighting, heating and ventilation of buildings for such work, and, in combination with the probable contents and the very excellent fire-fighting apparatus which was provided, succeeded largely in furnishing a satisfactory substitute (*for mill building*) for the "combustible architecture" which has preceded it. It must, however, be kept in mind that compared to the city building to be used for the "storage and sale of merchandise" the mill, even the cotton-mill, contains but little combustible contents and that the mill though often containing large unbroken floor-areas is of comparatively slight height.

When, therefore, the success of this construction (which was really the first work of the insurance-engineer) in reducing the fire-loss in mills brought it to public notice, and the attempt was made to adapt it for use in stores and warehouses, no adequate provision was made for the changed conditions. The requirements of trade called for offices and counting-rooms; they were partitioned off with hard-pine sheathing. The shape and size of city lots made it difficult to put the stairways and elevator-shafts in separate brick towers, as they are in the best built mills, so the stairways and elevators were put inside the main walls of the building and were left unenclosed or only partially cut off. The desire to have attractive salerooms led to the use of varnish in place of plain wood, or better still, well whitewashed surfaces. The necessary crowding together of buildings in cities makes thorough protection of outside openings most important. But shutters interfere with light, and require attention which, without mill discipline, was not easily secured, so shutters were neglected or often omitted.

The use of such buildings to house several tenants under one roof made the mill discipline impossible and increased materially the danger of fire from rubbish, from careless use of matches, from many other well-known causes. The lack of skilled mechanics as a part of the working force of such a building was no doubt a reason that proper fire-fighting facilities, as a part of the equipment of the building, were not more commonly provided. In short, there was an attempt to use "mill" construction for warehouses and stores without keeping in mind its essential features, which briefly are: No "vertical openings," no "concealed spaces," the minimum of "combustible finish," with ample facilities for extinguishing fire at its discovery, and ample protection from outside exposure. Under these circumstances it is not surprising that "mill" construction did not for city warehouses fulfill all expectations. Yet I do not feel that the construction was to blame, but the use made of it. Railroad semaphores are a necessary part of railroad equipment, and especially so in these days of fast trains, yet I once heard a first-class engine-driver say that "they got in the way like thunder when you wanted to make time," and I fear that this is the feeling of many merchants and owners of buildings as to the essentials of mill construction.

In the case of "fireproof" construction, difficulty seems to have come from a different cause. As in many other matters, the American tendency to go to extremes has resulted in undertaking the construction of enormous buildings, limited only by the strength of materials as to height and by the ground available as to area. In constructing such vast buildings, it has been assumed that because a material would not, under ordinary conditions burn, it was therefore "fireproof" or at least reasonably "fire-resisting." The enormous expense required by such construction has led to economies which have proved dangerous and to methods which fire has tried and found wanting. No one who saw the U.S. Government Warehouse, at Baltimore, soon after the awful conflagration of last year, can have any doubt that it is possible to build a warehouse of reasonable size which would even under the terrible strain of such a fire as that, be a protection to the merchandise within its walls. If it had not been for the alteration in its original form made necessary by the introduction of a modern elevator, I doubt whether the expense of repairing that building would have been more than the cost of glass for the windows and a little paint and putty.

It may be said that this building was not exposed to the extreme test of those awful hours. Yet buildings all round it were totally wrecked, and it stands to-day in practically its original form, except in the substitution of brick for granite for its interior columns.

And this leads me to a digression from the main thread of my argument. For thirty years every engineer, every architect, every builder of repute, has known that stone, especially granite and marble, while not in themselves combustible, are destroyed by fire

*A paper by Mr. F. Elliott Cabot, Assistant Secretary of the Boston Board of Fire Underwriters, read before the Boston Society of Architects.

almost as readily as wood. If any one had doubted it before last winter, the Baltimore fire proved it beyond any doubt. Yet I venture to say that there is not to-day a large city in this country in which there will not be during the year 1905 a large amount of marble or granite used in fireproof buildings, and in parts of such buildings so high above the street that the use of water to protect them from fire will be, so far as fire-departments are concerned, physically impossible.

Is it possible that the American brain, so fertile in every other direction, is unable to cope with the problem of designing and erecting an attractive and suitable exterior for a building which is *designed* to resist fire?

And now let us return for a moment to the false economies which so often confront the underwriter who, from the business point-of-view, is endeavoring to fix a proper price for the indemnity which he has for sale.

One of the commoner forms is the slighting or the deliberate reduction of the protection for the steel framing which is the skeleton of all these great buildings. The records of the cost of construction of some of the larger office-buildings destroyed in the Baltimore fire show that the marble wainscoting and flooring of the halls in these buildings cost more than the protection of the steel frames, and we know that in one building at least, a form of floor construction which was proved to be satisfactory was given up and a cheaper one, as it proved, entirely unreliable form submitted at a saving of one or two per cent. of the cost of the building.

We are asking these steel frames to carry enormous loads, to withstand great strains, and yet we grudge them the slight additional cost of a reasonable protection against fire, not only against conflagation but against such fires as have and will occur within the building or its immediate neighbors, and we spend twice the money which the proper protection would cost on decoration which may or may not be good art.

Again, it is a common practice to set interior partitions on top of combustible wooden floors, even when the partitions are made wholly of incombustible material, and as a result, a slight damage to the wooden floor wrecks twice its value in partitions and their finish.

We use iron face-plates on the fronts of these buildings and let the adjoining brickwork rest upon them so [illegible] of brick facing. Does it pay? Is it good work? Does the result justify it? Surely not.

In the fireproof building, too, we seem to depart from the construction which is justifiable for such work by the great expanse of unprotected windows.

Of course, light and air are most desirable, but from the underwriter's point-of-view it is fair to expect protection from more than the weather in the best type of [illegible] the destruction of several buildings of this type, especially in those of a great height, as they almost inevitably act as a flue to draw the fire from one story to another. If a large office-building is to be regarded simply as a stove which will from time to time be burnt out, it is perhaps sufficient to provide for protection to the building itself, but if it is to provide protection for its contents, then the vertical openings and the exposed windows need protection.

I have tried briefly to state why these forms of construction have not been as successful as they ought to have been, and I will endeavor briefly to give the insurance-engineer's hope of what may be done to overcome these difficulties.

Considering first the "mill" form of construction, I believe the automatic sprinkler, the fire-door and the fire-shutter, with a restricted use of combustible ni sh, will solve most if not all of our difficulties in this direction, I wish architects and engineers would make themselves more familiar with the use of sprinklers, because so much may be done in the construction of the building to make sprinklers thoroughly effective. A smooth ceiling or one with panels approximately 10 x 10 ft. or 5 x 10 ft. will give sprinklers the best chance to distribute the water to the best advantage.

For the "fireproof" building I must, at the risk of being called a crank, urge the use of "wire-glass" in metal frames, both for exterior use and where it is necessary to light stair and elevator wells.

Cut off the vertical openings, protect the steel frames everywhere and protect exposed windows, then "fireproof" buildings will come nearer to deserving their name.

THE ROWTON HOUSES.

The late Lord Rowton, who was Lord Beaconsfield's private secretary, devoted himself, after Lord Beaconsfield's death, to the philanthropic work of getting wholesome and comfortable tenements built for the poor of London. He organized companies for this purpose and they produced a type of apartment house which has since been repeated (though perhaps not as a copy) in the Mills hotels of New York. Lord Rowton had no architectural training but supplied its want by zeal in the humble department of comfort. His method was the unscientific one of "cut and try," but he cut and tried until he had succeeded in his aims, which were of the practical kind, that rooms should have sufficient room in them though small, that beds should be comfortable though simple, that washing apparatus should be of the right kind and such as would make life easy. To attain these ends he had actual models constructed and used them; slept in the beds and washed in the washing apparatus until they were right. With this kind of care he got good work done, and with this spirit he succeeded in inspiring others so that his companies carried out their work with an effect that at once produced a demand for more of the same kind. Several were erected before Lord Rowton's death a couple of years ago; and though his organization ceased the municipalities have got the idea.

A NEW STYLE OF STOVE.

A new type of stove, the object of which is the abolition of smoke, no matter what fuel is employed, has been demonstrated in London. The invention comprises a screen of tubular fire bsicks, made of special material, built up in the furnace in such a position that all the products of the fire pass through the screen, the latter quickly becomes incandescent, and flashes the gases as they pass through, thus preventinn formation of carbon. Bp the aid of this device coal of the worst description can be burned in the ordinary boiler with practically no smoke, and with a considerable saving in cost. For the purpose of demonstration cheap, damp coal dust was burned. The only result was a light gray cloud at the top of the chimney stack, which cleared away ln a few seconds.

PROFITABLE TREATMENT OF SEWAGE.

Sewage sludge is being treated experimentally at Bradford, England, under the direction of Dr. J. Grossman, to determine definitely whether any commercial fats can be recovered from it. The plant has a capacity of about 16 tons of sludge daily and is said to work without objectionable odor. It yields about 7 tons of manurial residue daily "containing besides free carbon 2 per cent. of nitrogen and 2½ per cent. of phosphate of lime." The distillation process is used and the value of the residue and the grease recovered is said to be greater than the working expenses.—*Engineering Record.*

Mr. J. J. O'Hearn, house, sign and ornamental painter and decorater, Toronto, has recently taken his son into partnership and the business is now carried on under the name of O'Hearn & Son. They have purchased the building they now occupy at 249 Queen street west, where they have one of the most commodious and up-to-date paint shops in the city and carry a large stock of paints, oils, varnishes, etc.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited

Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this Journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	S. G. CURRY, "
2ND VICE-PRESIDENT	W. A. LANGTON, "
TREASURER	HENRY SIMPSON, "
REGISTRAR	W. R. GREGG, 96 King St., Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	"
J. WILSON GRAY	"
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD, Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal.
2ND VICE-PRESIDENT	R. P. LEMAY, Montreal
SECRETARY	J. R. VANIER.
TREASURER	D. R. BROWN.

COUNCIL.

	Montreal.
	Montreal.
J. Z. ESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DUTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, Jr.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD O. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNEY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 478 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.
R. A. CARTER, Secretary.
H.A. BELL, Treasurer.
T. BRADLEY.
C. P. SHINDLER
K. M FRASER
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. R. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President. T.D. ROBINSON, Treasurer.
G BURBEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: T. G. Lallimer, R. Cass, F. Powell, M. B. Marlinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Colter, T. A. Giroin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAHER, Hon. Treasurer.
J. HERBERT LAURE, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY,
GEO. H. HOOD.
Past Presidents

CHAMBRE SYNDIC TE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, Jr., 2nd Vice-President.
ALCIDE CHAUSSE, Treasurer.
N. T. GAGNON, Secretary.
FELIX SAUBAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E Z. COTE
LOUIS PAVETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D McKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

PERSONAL.

Mr. G. A. Allan, architect, has recently opened an office at Brockville, where he was formerly in practice for a number of years. He will be pleased to receive manufacturer's catalogues, circulars, etc.

Mr. C. K. Shand, architect, formerly of Seattle and Chicago, and Mr. J. S. Pearce, architect, of Vancouver and Victoria, have formed a partnership, with offices in the Hadden Building, corner Hastings and Granville streets, Vancouver.

Messrs. Hooper & Watkins, architects of Victoria, B.C., have recently established an office in Vancouver over Robt. Ward & Co., in the Metropolitan Building. Mr. Hooper who is a brother of Mr. Sam. Hooper, Provincial Architect for Manitoba was formerly located in Vancouver, and comes back to take charge of the firm work on the mainland. They have plans in preparation for new brick block in Vanconver.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - EDITOR.

OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 211. JULY, 1905.

ILLUSTRATIONS ON SHEETS.

House in Jameson Avenue, Toronto.—Mr. R. J. Edwards, Architect.
Old House in St. Gabriel Street, Montreal.—Measured Drawing by Mr. C. S. Burgess.
Warehouses, Bay Street, Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House on Jameson Avenue, Front View.
Dining Room [illegible] No. 500 Willard Street, Ottawa.—Mr. J. M. H. Watts, D. C. A., Architect.

CONTENTS.

Editorial	97-99	Montreal Notes	108-109
Concrete Building blocks that Defy Detection	99	Dundas Quarry	110
The Life of a Sky-Scraper	90	Explains confusion at Babel	111
St. Mark's, Venice	108	Heating Apparatus and Bad O[illegible]	111
Our Illustrations	101	The T. Eaton & Co's. Store at Winnipeg	112
Indoor Humidity	101	Royal Art Treasures at the Toronto Fair	ii
Prof. Willet G. Miller's Report	101	Some Obscure Properties of Metals	ii
[illegible]y	101	Montreal Carpenters' Strike	xi
[illegible]	102-103-104	In Praise of Architects	xii
[illegible]anced Door	105	An Architects Suicide	xiii
Intercommunication	106-104	A Canadian Cathedral	xiii
A Novelty in Laying Concrete	108	Concrete Cottages in Liverpool	xiv-xv
Durability v. Porosity	108		

Good School Design.

It is worth while to call attention to the design for the Shepard school in St. Louis, of which [illegible] of good design which is simply the expression of the plan. The entrance, he says, is the only portion of these buildings which receives any effort in the way of ornamentation. This severity is entirely on the score of expense. There is no reason otherwise why every feature should not be made ornamental. But the design is not affected by this question. Whether plain or ornate it is the same and arises from a well disposed plan. We see so much in our school buildings of meaningless gables, towers that are expensive as well as meaningless, and windows displaced in the attempt to make an external arrangement with them, that it is satisfactory to find a set of schools which being eminently comfortable inside are made eminently satisfactory outside by simply walling and roofing in the interior arrangement. It is not to be supposed that there is no need for judgement and an eye for proportion in developing the exterior but, as every designer knows, things seem to fall in rightly together when one is on the right track.

Sand-blast Cleaning.

It is the fashion just now to clean up smoke-blackened stone fronts by means of the sand-blast ma[illegible] [illegible] cleaned stone [illegible] its [illegible] disturbed; and they predict a similar fate for the stone fronts. But the [illegible] do not appear to be the same. The stone surface was never a natural surface. It was a worked surface when the front was new and the present operations merely make it resume that condition. In some kinds of stone a hardened surface is acquired by chemical change. That will form again as before, accompanied no doubt by a similar blackening. The struggle against soot is vain for long. It takes only two or three years to make a front look grimy, and either the nature of our smoke or the nature of our stone makes that grime spread evenly without the *chic* effect of black and white—white on the exposed surface of a column and black where it retreats, like a drawing washed in by a skilful draughtsman—that makes the characteristic smoke effect of London on its buildings of Portland stone. The cause, a chemical disintegration of the exposed surfaces, must wear away the stone in time and does, in fact, give a rather leprous appearance to some carved figures of Inigo

Jones; but that is a long time ago and the structural stone seems to be practically unimpaired.

Vitiated Air in Tall Buildings.

If overcrowding in lofty buildings is considered a menace to health, so much so that a speaker in New York has held the sky-scraper and the hospital for tuberculosis to be parallel institutions, what are we to say of the fate of those persons who spend their days in the top storeys of the sky-scrapers; whose air supply is the air that has already served its turn in the lower storeys. Anyone who has ever occupied a room on the top floor of one of these buildings will recognize that they are like flues for the passage of air from below to above. A visitor to the roof of one of them through a little door at the top will, if its communication with the main shaft of the building is direct, find it necessary to hold on to his hat to keep it from being blown away by the gust of air that passes out when the door is opened. Even in summer, when the balance of weight might, one would think, be in favor of the air within the building, it is impossible to open the windows in the top rooms of a tall building without annoyance from the draught, which flutters papers every time the door is opened, and has been known to flutter them out of the window. Here is something to be abated in planning these buildings. The fresh air question does not always command respect in active life, but it is obvious that it is one with a question that does, viz., the fire question, or at any rate the question of suffocating smoke.

Overhead Signs and Telephone Poles.

The Toronto Board of Control has ordered the remo[illegible] which [illegible] street. The time limit for the change being set a year away, the support of public opinion may be necessary to prevent reversal of the decision. Merchants who have spent a good deal of money upon signs of this description protest that their signs are an ornament to the street. In a picturesque way there is perhaps something to be said for them, but, even if the question were one of beauty [illegible] kind of adornment, which is said to enliven the [illegible] of a Chinese town, is hardly the thing for a city like Toronto. A marshalling of lines in some way is necessary for the attainment of appropriate dignity. On this ground there is therefore an argument for getting rid of the higgledy-piggledy effect of projecting signs.

There is however not much use in talking about any dignity in streets that have overhead wires and are lined by telephone poles sticking up at every angle. If any preacher wants a comparison for the way in which evil fills the eye to the exclusion of the good let him refer to the telephone poles. Slight as they are and small in comparison with the buildings beside them it is extraordinary how the eye selects the drunken lines of the poles to the exclusion of the solid and abundant perpendicular of the buildings behind them. Indeed when there is a conflict of a single building and a single pole it is often the building that looks out of plumb, the eye giving all its confidence to the telephone company.

A Torontonian writing from Cape Town says he could not understand why the town, though smaller, is so much more pleasing and dignified than Toronto, until it struck him that it was the absence of telephone poles. There seems to be no town in Canada so small that it can do without the telephone, and we have to submit to the accompaniment of pine poles sticking up in our streets as they do in our forests. If there is anything in harmoniousness of character we have got it. Where nature flourishes (after the usual fire) the woods are topped by pine poles. And the habitations of man are similarly adorned.

New Building Laws and Old Buildings.

If the municipal attempt to have the staircase exit from the top floor of the Masonic Temple in Chicago increased, so as to make it sufficient for the uses to which the top floor has been put, is upheld, a precedent will have been created giving power to the municipality to regulate public safety to an extent so much beyond the usual bearing of a by-law that reflection upon it comes in alternate waves of satisfaction and doubt. The conditions of building in the United States are so like our own that a strong regulation must arouse our interest.

The facts are that the Masonic Temple, though built in compliance with the building law in force at the time of its construction, is now considered to be so flagrantly out of date in the matter of provision for the safety of its occupants, in case of fire or panic, that the city authorities have stepped in with demands for change, and a lower court has ruled that they are within their rights in doing so. The case has been taken to the Appelate Court and further movement in the matter awaits this court's decision.

The pre[illegible] will allow no [illegible] allow a number of halls aggregating not more than a capacity of 500 if the halls are small and there are two sets of staircases provided for egress from them. In the Masonic Temple there are eleven halls with an aggregate capacity of 1,300; and the halls are all on the upper floors, said to be "hundreds of feet" above the maximum height allowed by law. [illegible] ed from the owner is to make two clear flights of stairs [illegible] the bottom floor.

It is true, as one American journal says, that there are "owners who are eager to take as little precaution in the matter of public safety in public and semi-public buildings as they can get along with." If a building owner, who sees an expensive restriction coming, considers merely that he has done a good stroke of business if he gets his permit through and his building up before any one has a right to stop him, no freedom of action to deal with him, on the part of a municipality, will be beyond our sympathy. It is well that this sort of builder should know that he is not immune from interference because his building is built. For the other kind who keep genuinely up to current ideas, and only fall behind with time and the advance of experience, it is not such a hard case as may be supposed; for genuine thought is not likely to produce results that will be outclassed before they have served their turn with profit. The Masonic Temple, if it was originally designed for its present uses in the upper floor, never was safe; and that is why it suffers from municipal interference now.

CONCRETE BUILDING BLOCKS THAT DEFY DETECTION.

This is the seductive heading of a note in an American journal, which goes on to remark upon the uniform colour of ordinary concrete blocks "which detracts, in the eyes of some prospective purchasers, from their value as a material for making houses." Colouring matter unfortunately weakens the concrete, but "lately," our American contemporary announces "a new material has been found, which, when mixed with the concrete, will produce an almost perfect imitation of the stone that is used as a sample." Granite and Indiana limestones appear to be equally imitable by the use of this new material, and so perfectly that "at a few inches' distance even, the imitation cannot be detected from the original." It concludes therefore that "the time has come when persons of moderate means will be able to build imposing houses at less than one-sixth the cost of building them of real stone."

With the highest respect for our contemporary, and without ever having seen these imitations, it is still possible to affirm confidently that these imposing houses will impose on nobody as being built of either granite or Indiana limestone. One can stare by the hour at the marbles of St. Mark's, at Venice, and enjoy them the more for seeing them often, and yet one never tires the head to look at scagliola. There is no shock of surprise received at finding one of the marble columns in the Toronto City Hall with half its face off, showing its cementitious core? Nobody ever thought for an instant that they were marble. Yet if there is a good imitation of marble it is there. These imitations are in their way a wonder—only surpassed by the wonder that they should ever be made, for they have not the essential beauty of the substance they [illegible] ing [illegible] they [illegible] intended to [illegible] it would assume if finished in its own humble material.

It is a common place now that every building material has its own character; that success in designing with it is to be met by letting that character appear, and not by trying to get the characteristics of another substance. What then is the matter with concrete [illegible] uniform colour of roughcast work or even whitewash. And we may feel sure that the prospective purchaser who found a uniform colour in concrete blocks detractive of its value as a material for making houses is the same man who is so powerfully attracted by the uniform colour of pressed brick. The quality of the natural colour of cement is unpleasing and that no doubt is the whole difficulty. If the colour can be made right we shall probably think little about its uniformity, or of requiring blocks of concrete to look like blocks of stone in order to be acceptable.

How to affect the colour of concrete without affecting the strength of the cement is the question. Colouring matters not otherwise suitable for the aggregate have an unsatisfactory effect upon the strength of the concrete, and perhaps it is as well they have. If every man could work his will on concrete in the way of colour, the thought of what might result is not without its terrors. Coloured aggregate would no doubt be sufficient if it could be seen through the bloom of cement that lies on the outside of the castings. This, being very thin, cannot endure forever, so that an old concrete building, like other old buildings, is likely to have a charm of age in the improved colour and greater interest its surface will acquire by the action of the weather in the course of years. If we do not want to wait for that, and must imitate something, we can imitate the action of time by scrubbing the bloom off with a steel brush, (in the case of blocks, by machinery), so exposing the aggregate and getting a characteristic surface with colour.

Concrete blocks of this kind will look even less like stone than those do which defy detection, but they will make a good concrete block wall.

THE LIFE OF A SKY-SCRAPER.

This very live question has been investigated by the *New York Herald* without positive results, but with a strong presumption in favor of a much longer life than is necessary in this day of constant change, where even a million dollar sky-scraper may be regarded as a temporary structure, likely in time not to be worthy of its site. However, this is reckoning for a period of some length of time, and it is generally conceded that, if a steel building is safe, it is safe for a very long time. But if it is not safe, [illegible] can tell how long? In fact, how short—the time [illegible] before its collapse.

It is not a question of [illegible] strength, but of subtle and secret disintegration. Danger from vibration, corrosion, and electrolysis do not announce themselves except by results, and if anyone responsible for a building of this kind is disposed to apprehension he is abundantly supplied with opportunity.

As a matter of fact there is not thought to be real danger from vibration in the ordinary condition of steel [illegible] be met by sufficient insulation, and are so met in the care that is taken now-a-days in the erection of a sky-scraper. Every inch of steel is protected by paint or concrete. Even the interior of columns is filled in with concrete. The steel work itself is six times as strong as it need be. It is estimated that no wind that blows could lay it low, except as it does a tree, by tearing up its roots. And what wind could tear up the foundations [illegible] very often, thirty feet or more below the surface.

Yet of all the authorities consulted by the *Herald* not one ventures to give a positive assurance of safety without a qualifying "if." Safety depends not upon ordinary but upon extraordinary conditions of care; not, that is to say, upon sound calculation in the architect's office and good material upon the works, such as would, with ordinary workmanship, answer for the safety of a stone or brick building. Safety in in the hands of the workman. He has a responsibility such as he never had before, and the *if* upon which so much hangs refers to him. Will he rise to the occasion? Will he get above the idea of merely working between whistles and interest himself in his responsibilities? The skilled artisan of the day before machinery, whose supercession by machine feeders is the subject of so much regret, was supposed to take a personal interest in his work because of its dependence on his personal care. Here then in the personal care that the structure and protection of steel buildings require, is the way out of stupid toil and into personal interest in his work for

the modern workman. In the army and navy, where there is a tradition of personal responsibility and heroism; in engine driving, locomotive and stationary; and in other situations, where the safety of many recognizably hangs upon the hands of one, there has never been any difficulty upon that score. The workman does rise to his responsibilities, and on their account enjoys the more his work and the title to respect which its importance gives him. Any increased responsibility which modern building gives to the modern workman will undoubtedly find him respond; and of steel buildings as a class we may dismiss the idea that, where a danger to their length of life is known and the precautions that must be taken against it are understood, there need be any anticipation of the life being shortened because the precautions are not properly carried out.

There is still the unknown to speculate upon, and this more than anything seems to make engineering authorities pause in assuring steel buildings of the life which they say is possible to their materials. "If," their reply is summed up, "the steel frames shall remain untouched by any destructive agency of which we are now ignorant, they will stand 5,000 years. But steel, unlike granite, brick and wood, is essentially an untried element in building construction, and we must wait for the years to demonstrate how well it is going to serve us."

What this destructive agency is may yet be revealed by failure, or when a building of age sufficient for its development is pulled down. Hitherto no typical building of sufficient age has been destroyed. When such an instance occurs it will be an event of so much public import[illegible] that the post mortem [illegible] ought to be in the hands of a Government commission of experts and every facility given for builders of sky-scrapers to personally inspect the operation.

ST. MARK'S, VENICE.

The warning given by the fall of the Campanile of St. Mark's at Venice, has so alarmed the authorities about the condition of the church itself that a careful survey of the building has been made and a report presented which suggests not only the insertion of new [illegible] and [illegible] but the [illegible] and restoration of the mosaics which decorate the surface of the vaults. Mr. Reginald Blomfield has written to the *Times* to protest against this kind of restoration, which would amount to the destruction of a great part of St. Mark's as an historical monument. It is impossible to number mosaic tesserae and replace them as they were, as was done with the ashlar of Peterborough cathedral. The old material may be used, as far as it remains unbroken, and the old design followed; but as handiwork of the eleventh century it is not the same.

It is proposed also to restore the capitals of the gallery and to level the undulating floor which is understood to have been as it is for centuries. Against all this disturbance of surface Mr. Blomfield protests as unnecessary for security. The engineering proposals are sufficient with the addition of some visible stays which may offend the "unfortunate passion for neatness," as he calls it, of the Italians, but do not really interfere with either the beauty or the interest of the monument.

His protest has been taken up by the Society for the Protection of Ancient Buildings, who have issued the following memorial to be signed with influential signatures, and will then forward it to the Italian Minister of Public Works.

To His Excellency the Minister of Public Works of Italy.
St. Mark's, Venice.

We, the undersigned, having in view the inestimable value of St. Mark's Church at Venice as an historical monument of great beauty, submit to your Excellency that it is of vital importance that the building should be handed down to posterity intact, except for such works as are proved to be necessary to its preservation.

We feel confident that such works as underpinning, consolidation, and strengthening generally will be dealt with in a competent manner by the architect now in charge of St. Mark's, but we venture to submit that the substitution of modern reproductions for the old carving, the removal of the mosaics to the tribunes or piers supporting the central cupola, and more particularly the taking up and levelling of the old floor of the church, would not in any way whatever contribute to the security of the building, whereas such works would destroy what have been for centuries its characteristic features.

We submit that no modern reproductions, however exact, can have the same value as the original work; that, in the case of St. Mark's, the affection of educated people in all countries is concentrated on the stones and marbles themselves as they now are, and as they have ever been, and therefore that their disturbance and renewal would inflict irreparable injury on the historical value of St. Mark's and would destroy the infinite attraction which it still has for those who consider the past.

We therefore appeal to your Excellency to direct that the proposals to interfere with the mosaics, the carving and the floor shall be abandoned, and strictly to limit the works now being undertaken to what is proved beyond question to be necessary to the permanent stability of St. Mark's.

A few days later the following telegraphic news from Venice appeared in the *Times*:

The persons who are directing the work of restoration in the Basilica of St. Mark wish to have it known, especially in England, where criticisms have been passed on their undertaking, that some restoration of the walls being not only indispensible but urgent, the work is carrying through [illegible] exact mould has been taken of them. After the restorations are made the mosaics are put back in their places with the greatest attention to the indications of the mould, so that not the least alteration will take place. It is, in other words, almost the same process as that for removing a fresco. A successful example of this was the removal of the famous fresco discovered a few years ago behind Tintoretto's "Paradise" in the Doge's Palace. As to the floor of the Basilica, it is a question of [illegible] All works are proposed and executed under the constant surveillance of a special artistic commission.

We may hope that, as everybody seems to be alive to the desirability of as little disturbance as possible of the building as a document, the *juste milieu* will be followed.

The same telegram states that the piling for the Campanile is complete and the foundation wall is begun. The piling has been made solid, so that the foundation wall stands on a platform of piles. The wall is 10 feet thick at the base. This does not indicate a spread of footing more than about 2 feet on each side; for the hollow wall of the shaft, with an inclined pathway to the top, can hardly have been less than six feet in total thickness.

There is no complete drawing in existence of Sansovino's Loggetta which was built at the base of the Campanile. The design is being patiently reconstructed from fragments of detail found in the ruins.

OUR ILLUSTRATIONS.

THE DINING ROOM—NO. 500 WILBROD ST., OTTAWA, MR. J. W. H. WATTS, R. C. A., ARCHITECT.

This is the dining room of the house by Mr. Watts of which a view was given in the last number of this journal.

HOUSE ON JAMESON AVE., TORONTO — MR. R. J. EDWARDS, ARCHITECT.

The interest attaching to this house, besides its agreeable appearance, is the employment of Roman Stone (concrete) in place of the wood that has hitherto taken the place of stone for the columns, cornices and balustrades of old Colonial work. Both in durability and colour the artificial stone is better than the white-painted woodwork that we are accustomed to see in this kind of design.

OLD HOUSE IN ST. GABRIEL ST., MONTREAL—MEASURED DRAWING BY MR. C. S. BURGESS.

For comment see Montreal Notes.

WAREHOUSES, BAY STREET, TORONTO,

The rebuilding of the district destroyed in the Toronto Fire is going on rapidly. Our illustration shows a row of the smaller warehouses on Bay Street, most of which have been completed and occupied for some time.

INDOOR HUMIDITY.

Indoor humidity has again been discussed by a member of the medical profession, who takes the stand also that the excessively dry air of houses during the heating season is injurious to the human organization, because the dry air in passing over the membranes of the respiratory passages and the skin calls for an enormous output of the fluid elements of these tissues. This physician, Dr. Henry Mitchell Smith, of Brooklyn, N.Y., holds that this leads to glandular overactivity, and its consequent evils, but he does not offer the specific proofs which, it has been asserted, are lacking to show that direct deleterious effects are thus produced. In his contribution, which was made to the Brooklyn Medical Society, he mentions, however, some tests he had conducted with a radiator having an experimental moistening apparatus attached, and he obtained results which concur with general beliefs as to the relation of the humidity and temperature.

He found that with a relative humidity never below [illegible] was uncomfortably hot, 68 was warm and 65 comfortable. It was determined by repeated experiments that a temperature of 65° to 68° and a relative humidity of 60 per cent. produced the most comfortable conditions, which were in marked contrast to a temperature of 72°, with a relative humidity of 30 per cent. The former felt warm and balmy, he said, and the latter, notwithstanding the higher temperature, chilly and dry, and apt to leave the impression of draftiness. He did not describe the moistening apparatus, but said that the mechanism was such that the control of the temperature and of the moisture were independent.—*Engineering Record.*

PROF. WILLET G. MILLER'S REPORT.

In Ontario very little use has been made of the crystalline limestones which are adapted to decorative and monumental purposes. At the present time, so far as is known, only two quarries are worked for marble. The marble used in this country nearly all comes from the large quarries in the United States. Although there are in the Province native varities that are as good, trade prejudices favor the imported article. —*From Prof. Willet Q. Miller's Report to the Ontario Bureau of Mines.*

BY THE WAY.

Bank wrecking and house breaking have their respectable branches. The sign "W. Sykes (or another) Housebreaker" is frequently met with in London, looking down on an unperturbed policeman; and a small crowd of onlookers have daily countenanced the operations of the men who, as the newspapers say, have undertaken to wreck the Traders' Bank in Toronto in two weeks. There is a science in pulling down as well as in putting up and that a five storey building of substantial character, standing on the street line, should be taken down in that time without noise, without dust, and without danger is a piece of all Canadian work that Messrs. Carrère & Hastings, when it comes to their turn, are not likely to excel.

* * *

Careful experiments are going on in Boston, under the direction of R. Clipston Sturgis and Edmund Wheelwright, in order to get hold of certainties with regard to lighting, and especially top-lighting, for the new Museum of Fine Arts in Boston. A temporary structure has been erected on the site of the proposed building in order to determine the relative value of natural light from various points of the compass. This is not model in miniature, leaving room for doubt, but a full sized section equal probably to one room of the gallery, for the skylight is 40 feet long and 22 feet wide, properly equipped with glass and weighing several tons. The model is not only of the full size of a room but can be raised up to the level it will occupy in the building. And here, mounted so that it can be moved about at various angles, all the peculiarities of the light will be observed for a period that may consist of months; indeed, if the varied lighting of the seasons is to be observed, the observations must take months. The report, based upon these experiments and upon a subsequent tour of inspection of the great museums of England and the continent, will form the basis later of a limited competition for the new museum building.

* * *

The wonderful Lake-on-the-Mountain at Grenora is likely to be used for the production of electric power.

A company has been formed for the purpose of testing the capacity of the lake to see if the supply of water is likely to be sufficient for the purpose. The peculiarity of the lake is that no one knows where its supply of water comes from. Perched on the top of a bluff, 200 feet above the level of the Bay of Quinte and so near the edge of the rock that at one point it is not more than a hundred yards from the side. The little lake, 400 acres in extent seems designed by nature to be a reservoir for power. It has in fact been so used for the last hundred years, (since U. E. Loyalists settled in the neighbourhood), but on a small scale. A flour mill and a foundry at present lie at the base of the rock and are run by an outflow of about 1580 cub. ft. of water per minute. This apparently does not fail, and, when the mills are shut down and this draught on the lake is discontinued, the level of its water does not rise. Is it in a state of equilibrium with a source of supply at some distance off? And how great draughts can be made upon this source of supply?

SCHOOL BUILDING.

REPORT OF THE COMMISSIONER OF SCHOOL BUILDINGS, ST. LOUIS.

By the kindness of Mr. William B. Ittner, Commissioner of School Buildings of St. Louis, we have received a copy of his just published annual report to the Board of Education of the City of St. Louis. That portion of the report which relates to the new school buildings is of great interest as representing the latest developments and evidencing high perfection. We reprint it *in extenso*.

The prevailing and approved type of building in vogue previous to the present administration (1897) was three stories high. It contained 12 class rooms, four on each floor; a corridor ten feet wide passing through the center of the building, was lined with wardrobes on either side and terminated at the rear of the building in a corridor at right angle with the main axis of the building. This corridor was sixteen feet wide and contained two stairways, usually of iron

stringers with wooden treads, inclosed by brick walls. Entrances were provided to the yards and basement with vestibules under the first landing of these stairways, as well as at the front of the building directly into the main corridor.

The class rooms were usually 28x30 feet with a clear storey height of about fourteen feet. They were lighted, as a rule, from two sides, the windows generally containing transoms.

The corridors were of fireproof construction, while the class room floors, attic floor and roof, were of ordinary joist construction, the roof being covered with slate.

Where more than twelve rooms were required, the main corridor was extended; and twelve rooms, duplicating in plan the main building, were erected, with one additional stairway closing the extreme end of the corridor.

The toilet rooms, as well as the heating and ventilating apparatus, were placed in the basement. The sanitaries were of an inferior make and were generally without proper ventilation.

The heating and ventilation system was of the plenum type, with furnace or steam for heating the air. The furnaces were found to be totally inadequate for proper heating, and were in constant need of repair; this led finally to the abandonment of the furnace.

The cost of these buildings was $0.12 per cubic ft. or $94.50 per pupil.

The objection to this type of building, aside from its defects as a good substantial structure, was the dark corridor lined with wardrobes which were without ventilation; the cramped and inadequate exits; and the size of the class rooms which were much too wide for perfect lighting; this, together with the passage of the new building laws (approved April 7th, 1897) requiring school buildings to be fireproof, demanded a radical departure from the prevailing methods.

Before plans for any new buildings were attempted, a careful study of the school house problem was begun, through all obtainable publications upon the subject, as well as through a visit to all cities in the country offering anything in the line of modern school house planning. The result of this study led to the adoption of the present plan, as one meeting local conditions in all respects. Its success has been such as to fix, for the present at least, the plan for our city, as well as to influence in a large measure the school architecture of the country.

The effort has been to develop a plan in line with the best thought and most thorough study of school architecture; one that would insure improved hygienic condition, and consequently preserve the health and morals, as well as promote the intellectual progress of the pupils; and at the same time invest the buildings with that measure of architectural fitness now recognized as essential in training the minds of the pupils to the perception of the beautiful, during the most receptive period of life.

Briefly summarized, the general requirements that have influenced the plan, design and construction of the schools may be stated as follows:

SIZE OF CLASS ROOMS.

The adoption of the almost universal rule advanced by experienced educators, that a class room should accommodate not more than fifty pupils, forms the keynote to and has largely governed the planning. Authorities agree that each pupil in the grammar grade requires a floor space of about sixteen square feet, and two hundred cubic feet of air space; it follows that a room approximating 24 or 25 feet wide by 32 feet long by 13 feet six inches or 14 feet high, will give the required accommodation, admit of adequate lighting and enable the teacher easily to control the room. With

such a room as a unit, it follows that the rooms should be so disposed as to receive light in sufficient quantity and render them easily accessible from stairways and corridors wide enough to permit rapid circulation of classes, and egress.

CORRIDORS.

Another consideration that has influenced the plan was the endeavor to depart not only from the conventional type of school building, wherein the central corridor lined with rooms on each side, was necessarily dark, but to introduce, if possible, outside light into the main corridor throughout its entire length, thus insuring the penetration of sunlight to all parts of the building during some part of the day. This naturally led to a plan grouping the class rooms on three sides of the corridor only; the remaining side being open almost its whole length to the light.

WINDOWS.

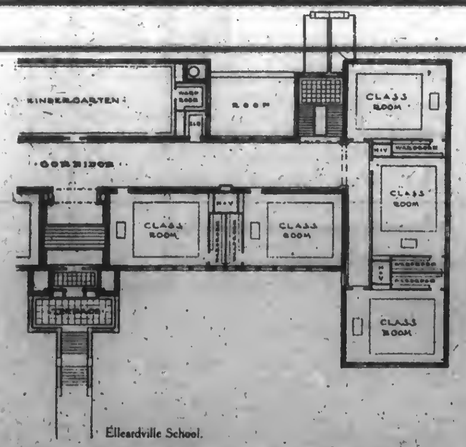
Since the success of a school building depends upon the adequate lighting of its class rooms, it naturally follows that the width, height and location of the windows dominate the exterior design. In no case is the window surface less than one-fifth of the floor area.

It is conceded that the maximum, if not all, of the light should come from the left of the pupil, and preferably from one side only, in order to avoid cross lights. Windows set 3 feet 6 inches, above the floor and extending to within 6 inches of the ceiling, are located to diffuse the light. This fenestration is possible except in corner rooms, where small windows are introduced on one other side of the room, in order that the design should receive fitting architectural treatment; it being manifestly impossible to locate desks in all rooms so that pupils will receive light from the left only, without enclosing the facade side of the room with a blank wall.*

GENERAL GROUND FLOOR.

The general plan developed by these rigid requirements is necessarily more or less similar in all of the schools approximating in form the letter E, except where kindergarten rooms are incorporated in the plan. In all cases the sites have been wisely selected to permit ample space surrounding the building, affording generous playgrounds as well as good light and air.

The basements average 15 feet in height (or a clear height of 12 feet under heating ducts) and have been planned with the view of supplying separate playrooms for boys and girls for use in inclement weather, and rooms for physical culture, as well as affording space for the installation of the heating and ventilating plant, the storage of coal, and the general toilet rooms for both sexes. On the floor above the basement, corridors



Ellsworth School.

sibility has been met. The perspective of this school is quite satisfactory also.

rooms averaging 25x32 feet 6 inches in size, with ceiling 13 feet 6 inches to 14 feet in height. Wardrobes or coat rooms lead from class rooms only (a radical departure from the usual custom of opening them upon the corridor as well as into the room), an arrangement that not only gives the teacher full control over the class room and wardrobe, but permits ventilation of the room through the wardrobe; the constant passage of air carrying with it the vitiated air from the room, as well as odors arising from damp clothing in the wardrobes, thus entirely eliminating the disagreeable odor usually prevalent in schools.

Staircases are located at each end of the corridor on the open side, thus permitting rapid egress. In no case has the height of the buildings exceeded three stories; the tendency in the later buildings being two stories, with basement entirely above the ground.

HEATING AND VENTILATION.

The buildings have all been planned for a mechanical system, using low pressure steam and a fan for forcing the air. This method insures (regardless of the state of the weather, or the humidity of the air) a positive flow of pure warm air at a uniform temperature into each room, and a consequent outflow of a like quantity of vitated air through the wardrobe vents.

The system has been designed on the basis of supplying each pupil with 30 cubic feet of air per minute, this amount being exceeded somewhat under actual working conditions. This delivers to each room 1,800 cubic feet of air per minute and changes the entire volume of air in the room about every seven minutes. This is accomplished with a steam pressure of from 5 to 15 pounds upon the boiler. The system is arranged so that the building can be warmed in mild weather by the exhaust steam from the engine that propels the fan. Experience proves that this is possible [illegible] for [illegible] third of the heating season, thus effecting a material reduction in the consumption of fuel.

Fresh air is drawn into the fans in the basement, usually from an elevation of about 30 feet above the ground, first passing through the tempering coils, where the temperature of the air is raised to about 63 or 70 degrees Fahrenheit. It then passes through the fan to the heating coils, where the temperature can be raised to any required degree. It is then driven through ducts from the hot chamber to the various rooms and corridors.

The heating coils are arranged with a system of by-passes and double dampers so that the air may be taken from the hot chamber, or may be mixed with [illegible] and delivered to any desired degree. The system is therefore very flexible and capable of many combinations at the will of the operator.

The warm air is introduced into the rooms about eight feet above the floor, the heat inlets being placed at or near the same end of the room as the outlet.

The air enters the class room at a velocity of about 300 feet per minute, and by means of deflecting blades at the inlet is evenly distributed throughout the entire room. The air is thus compelled to make a circuit of the room before passing out through the wardrobe vent.

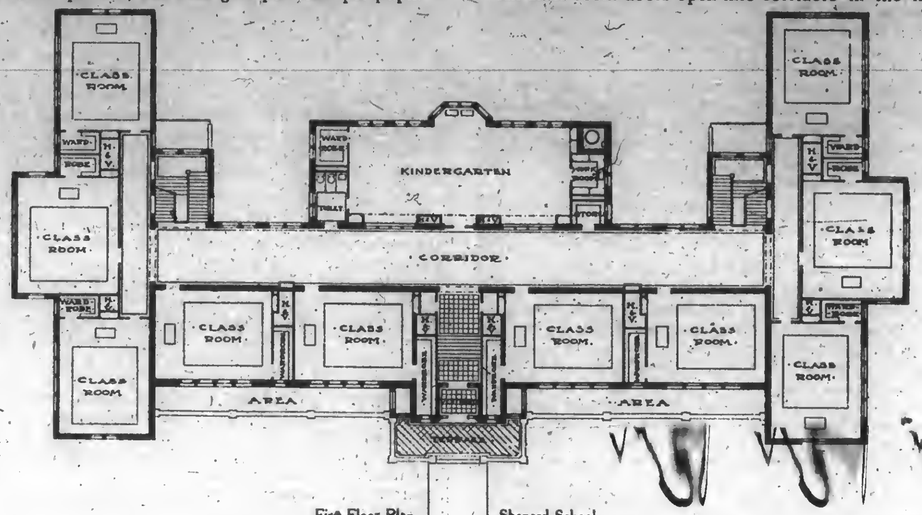
The thermostat device to regulate the temperature is placed at or near the opening leading from the class room to the wardrobe; and when set at the temperature desired, maintains it within a variation of one degree during the entire winter.

For the schools in the down town, or particularly smoky districts, an air washing device is being installed. This device will also be used during the summer mouths and the rooms rendered comfortable from the constant flow of cool air.

In order to heat the building rapidly in the morning the system is arranged to by-pass at the fresh air inlet, the fan drawing the air from the rooms and corridors, thus converting it into what might be termed a direct

system for a sufficient length of time to thoroughly heat the building before the fresh air inlets are opened and the breathing process of the building is begun. All toilet rooms are separately ventilated to a stack that is kept heated at all times.

The average cost for heating and ventilation by this method for the last two firing seasons, with soft coal at $1.88 per ton, has been 36.1 per cent. per pupil.



First Floor Plan, Shepard School.

CONSTRUCTION.

All outer and interior bearing walls are of hard brick laid in Portland cement mortar. Interior non-bearing partition walls are of hollow tile, and the buildings are plastered with cement or hard plaster. The interior framing is of steel girders and floor beams, the spans varying from 10 feet to 12 feet. Floors are constructed with a system of concrete and metal. Some of the later buildings have floors constructed entirely of armored concrete.

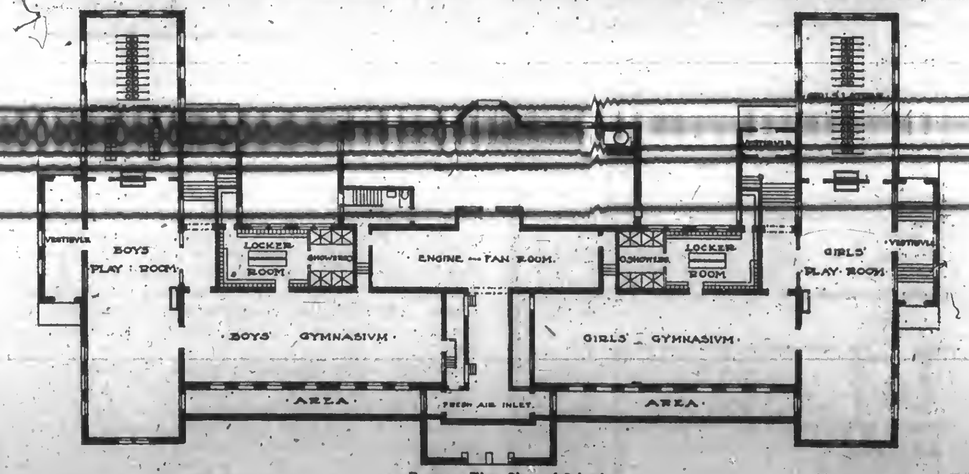
All stairways are of iron or armored concrete five feet wide; the wearing surface of the treads are covered with asphaltum, which renders them noiseless and non-slipping. The roofs, where pitched, are covered with slate or tile, cemented and nailed to concrete or sheathing. Flat roofs are cemented and covered with composition roofing. Gutters are lined with vitreous tile bedded in asphaltum, or are of copper, copper being also used for the downspouts. Corridors are paved with granitic mosaic, with six-inch borders and bases of marble, or are of narrow maple flooring closely laid.

Basement floors are of granitoid or cement, with an asphalt finish in toilet rooms. Class rooms are floored with closely laid maple flooring. Such woodwork as is used is of quartered oak and simple in design.

All class room doors open into corridors in the line of direct travel to the exits, and are leather-covered and equipped with floor hinges.

The plumbing is of the most approved sanitary type, and is installed like the balance of the work, under a system of rigid inspection. The water closets are installed in a series of automatic flushing ranges, the frequency of the flush being regulated by the flow of water into the flush tank. Each closet is vented at the closet seat through a 1-inch by 6-inch vent opening.

The urinals have marble partitioned stalls; are automatically flushed the same as the water closets, and are vented through an opening along the base at the floor. The vent ducts from water closets and urinals are connected to a heated stack, the fresh air, after making the circuit of the room, passing out through the fixtures themselves through these vent ducts to the stack.



Basement Plan, Shepard School.

EQUIPMENT.

Class rooms are equipped with natural slate black boards set 1 foot 9 inches above floor for lower, and 2 feet 6 inches for higher grades, and extending around the three inner walls of the rooms. The desks are of the single adjustable type, with aisles 18 inches wide between desks. A bookcase, shelf and wardrobe are provided for the teacher, and cases are placed in the library, kindergarten and storerooms for books and supplies.

Drinking fountains are installed in corridors, as well as in yards and basements. Class rooms are painted in lead and oil, the colors being carefully selected with respect to the location of each room and its relation to the point of the compass; in general soft tints of green are selected for the south rooms, while yellow and red tones are used in the rooms having north or cold exposures. All rooms have a stenciled frieze and picture moulding. The corridors are also treated in the same manner, and serve for exhibition of photographs and class work. Kindergartens are sometimes decorated with mural paintings, typifying the life of childhood.

Each room has a self-winding electrical clock, regulated from a master clock in the principal's office.

Artificial light is furnished by gas or electricity.

SCHOOL GROUNDS.

Believing that a large well-located site is a wise investment, the Board of Education has purchased generous sites for all new buildings. This, aside from the desirability on the score of light and air, has enabled the department not only to provide ample playgrounds, but has given opportunity in a modest way for making our school grounds object lessons of refined civic taste in the art of landscape gardening.

Each school ground can thus be made to present to the juvenile mind some distinct instructive feature, awakening an interest in the knowledge of decorative plants and their use in the embellishment of home and city at large.

Thus the school grounds through a modest beginning may be made an important factor in the educational system of our city, and it is hoped that this feature will be made a permanent part of every school.

DESIGN.

In their design the effort has been made to avoid the use of extravagant material and ornamentation and the straining for effect not justified by the function expressed in the plan.

In most instances the buildings are faced with ordinary hard and red brick mixed as to color and laid up with a large bed joint in garden wall or flemish bond. Stone is used sparingly, and no attempt is made to accent any part of the building except the main entrance, which is generally dignified by fitting architectural treatment.

The attempt has been made to invest each building with some degree of individuality in the belief that this, together with simplicity in design and material, will more clearly express the tendency of the times, and that buildings so expressed will more nearly fulfill their purpose as part of our great system of education

---

Here follows a list of the schools (19 in number) built since June, 1897. In this list, the Shepard School, which we have chosen for our illustration (out of three given) is scheduled as fireproof, with 24 rooms, 1,200 fixed seats, and costing $154,254, which is 16½ cents per cub. ft. and $128.54 per pupil. As a means of comparing this with the cost of our own schools the next section is useful.

It will be seen that the cost of our buildings has increased from 11 and 12 cents per cubic foot in 1898 to 16 and 17 cents per cubic foot in 1904-05. This is accounted for by the steadily increasing wage scale since that time, and a corresponding increase in the price of all building materials. It may be fairly assumed, nowever, that the highwater mark in the price of materials and labor has been reached, and although there has been no decline in these items since the close of the Louisiana Purchase Exposition, the change, if any, will reduce rather than increase our present costs.

The following tables will illustrate the change which has taken place in the price of labor and material during the period:

WAGES PER HOUR

	1898	1899	1900	1901	1902	1903	1904	Jan. 1 1905
Carpenters	$0.35	$0.35	$0.35	$0.45	$0.45	$0.55	$0.55	$0.55
Stone Masons	.50	.50	.55	.55	.55	.60	.60	.60
Bricklayers	.40	.50	.55	.55	.60	.65	.65	.65
Plasterers	.37½	.37½	.62½	.62½	.62½	.75	.75	.75
Tinners	.30	.35	.40	.40	.45	.50	.50	.50
Iron Workers	.35	.35	.40	.45	.50	.55	.55	.55
Slaters	.45	.45	.45	.45	.45	.40	.55	.62½
Comp'n Roofers	.35	.35	.40	.50	.50	.60	.50	.50
Painters	.31¼	.31¼	.37½	.37½	.42½	.50	.45	.45
Plumbers	.43¾	.43¾	.50	.50	.50	.62½	.62½	.62½
Steam Fitters	.50	.50	.57½	.57½	.62½	.62½	.67	.67½
Electrician	.37½	.37½	.37½	.37½	.50	.62½	.62½	.62½

To illustrate more clearly, an hour's labor of all mechanics employed upon the schools in 1898 cost the Board $4.90. An hour's labor by the same mechanics in 1904-05 cost the Board $7.10, an increase of 45 per cent.

The rise in the price of building materials has been just as marked:

	1898	1899	1900	1901	1902	1903	1904	Jan. 1 1905
Brick per M	$ 4 50	$ 5 65	$ 7 00	$ 7 50	$ 7 75	$ 8 00	$ 7 50	$ 8 00
Steel per ton	24 00	36 00	38 00	32 00	40 00	32 00	31 00	32 00
Lumber per M	16 50	16 50	18 00	19 00	20 00	20 00	20 00	20 00
*Plumbing Supplies	.....	.....	.....	.....	.....	.....	.....	.....
*Electrical Supplies	.....	.....	.....	.....	.....	.....	.....	.....
*Steam Supplies	.....	.....	.....	.....	.....	.....	.....	.....
Hardware	39 35	40 50	41 65	43 00	44 40	46 20	49 35	56 95

* The advance in these items has been from 25 to 65 per cent.

It is only fair to state that in 1898-99 both the building material and labor market were recovering from the panicky prices of 1893-94.

The report continues with an account of reconstructions, repairs, etc., which, except as showing that these are in the direction of fireproofing, wardrobes, better lighting and modern heating and ventilation, are of less interest to us. But the summary of cost, with which the report concludes, is interesting. This summary states that the expenditures through the Department of School Buildings and contracts let from June 30, 1897, to January 1, 1905, have been $5,137,157.22, and the cost of the Department in salaries, etc., for the same period has been $149,977.10, or 2.72 per cent.

A NOVEL BALANCED DOOR.

A Belgian inventor, Mr. Joseph Henri Dierickx, has recently produced a door which is a radical departure. It consists of two leaves, which are so pivoted that they will swing into partitions as the door opens, leaving an entirely clear passageway. Thus, the new doors partake of the advantages of both the hinged type and the sliding type, while avoiding their objectionable features. The common hinged door has heretofore been considered the most satisfactory type where space allows of its use, because of the ease with which it can be swung open. The sliding door, while it overcomes space objections, is nevertheless not perfect. The rollers on which it travels are too apt to slip off the track, causing the doors to stick and jam.

Mr. Dierickx's door is formed of two triangular leaves, which, when the door is closed, meet on a diagonal line of junction. The leaf, which is largest at the top, is pivoted at the lower corner, and the other leaf is swung from a pivot above the centre of the doorway. A rod connects the two leaves in such manner that when either one is swung in a certain direction, the other will swing in the opposite direction. Thus, in opening the door, it is not necessary to seize both leaves and move them, for if either leaf is moved into or out of its pocket, the other will automatically move in harmony with it. The two leaves are also so connected that they counterbalance each other, and they are controlled in their movements by suitably grooved guides, in which they travel with a minimum of friction. No rollers are necessary. The peculiar shape of the door is apt to strike one as awkward at first; but this is due mainly to the fact that we have always been accustomed to rectangular doors. *Building News.*

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent to. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

Q.—What effect would tar paper have on galvanized shingles when the tar paper is laid under the shingles and next to them?

A.—Tarred paper for some unexplained reason—perhaps galvanic action—has a tendency to cause small holes to appear in galvanized iron when used as a roof covering. This may not occur however for many years after the roof is finished. If a current of air circulates between paper and iron, this defect never appears. A dry felt paper, or better still, asbestos paper, laid under shingles of any kind, is very much better than tarred paper. In the case in question, there is no need for alarm, as I imagine the roof has a good pitch, and the trouble alluded too only occurs in roofs that are flat, or of very little pitch.

From "Young Plasterer", will you kindly inform me as to the method of making plaster of Paris set hard and strong, and of giving it a glossy surface.

Ans.:—Plaster of Paris may be hardened by mixing it with water that contains lime or a solution of gumarabic. Smoothing, coloring and subsequent polishing the plaster with oil produces a marble like surface.

From "Contractor"—Having a number of pine window-frames to make for a brick house, frames specified to be first class and to have oak sills, boxed venetian blinds, several to be made to fit a circular tower and to have circular heads. I am equal to the construction part; but lack knowledge as to what is meant by first-class frames. Can you give me any information on the subject?

Ans.:—We submit the following which we think covers all the ground contained in your queries.

1. For first-class pine sash frames the linings should be mortised and tenoned at the heads, and the outside linings stump tenoned into the sill, the latter to be left projecting ¼ in. The head and pulley stiles should not be less than 1⅛ in. thick; the pulley stiles to be checked for the guard bead; the pockets to be cut in centre of stiles and pocket pieces, v-pointed or beaded, to prevent damage to paint when removing.

2. In sash frames all linings should be grooved, and tongues worked on head-and-pulley stiles to fit same. The head linings should be well blocked.

3. Bottom meeting rails of sashs should be housed into stiles and also dovetailed.

4. In spacing for sashes it should be remembered that stuff wrought both sides finishes ⅛ in. less than reputed sizes, e.g. 2 in. is 1⅞ in. bare when finished.

5. The ventilating piece should be bevelled ¼ in. and tongued into the sill, housed into the pulley stiles, and have the guard bead stuck on the solid. All beads should be mitre rebated, and fixed with cups and screws. It improves the frame to return the parting bead across the head.

6. The oak sill should project at least ⅛ in. beyond the face of outside linings because if finished flush it will shrink below the face in a short time, and expose the edges of linings to decay.

7. Keep the water bar near the outside edge of the sill. Groove the back edges of the inside linings, and insert the back lining in the groove.

8. Wide or heavy sashes should have a pair of 3 in. brass sunk flush lifts let in the bottom rails, and a pair of brass handles fastened under the top meeting rail near the stiles if there are no vertical bars.

9. Very high sashes should have cords with handles attached fixed in the centre, with a long arm and hook provided for lifting. A recess should be provided in back of architrave to receive this.

10. Circular headed frames should be cut out of the solid, in two thicknesses, the pieces forming each ring to be of different lengths, the butt joints tongued, and the pieces screwed together. The head should be cut back a few inches above the springing to form a stop for the sashes to prevent them from jamming.

11. "Circle on circle" sash frames should always be made with the pulley stiles parallel, otherwise the top sash must be inserted from the outside, rendering it difficult to make the frame watertight, and dangerous to renew the cords.

12. For quick sweep on plan, these frames require purpose made axle pulleys, the face plates to be set at an angle with the pulley boxes, and in pairs.

13. Bay Window Frames—The sills of these should be mitred at the point, ploughed and tongued, and fastened with a handrail bolt. These should be Brunswick blacked before insertion to prevent corrosion. The heads should be solid and halved together.

14. Venetian Frames with side lights fixed can have solid mullions about 2 in. thick, the cords from the middle pair of sashes being taken over pulleys in the top ends of the mullions, and through the top rails of sidelights into the outside casings. In consequence of the greater width of these frames, and the possible weight they may have to carry, it is usual to make the heads solid—about 3 in. thick. The mullions should be tenoned through the head and sill, and the outside linings stopped at the sill and tongued in, so that the sill may be continuous.

15. Boxed Venetians—When it is desired to hang all the lights, the mullions must be boxed and divided by a parting lining. When this form would be unsuitable through the width of the mullion, a mullion with a single hanging can be used, by hanging two sashes to one weight, having a pulley fixed at one end. To obtain the necessary weight in small compass, it should be of lead and in square section.

16. Single lights are useful for thin walls. One half of the frame is glazed, and the other half contains a sliding casement, working on metal bars.

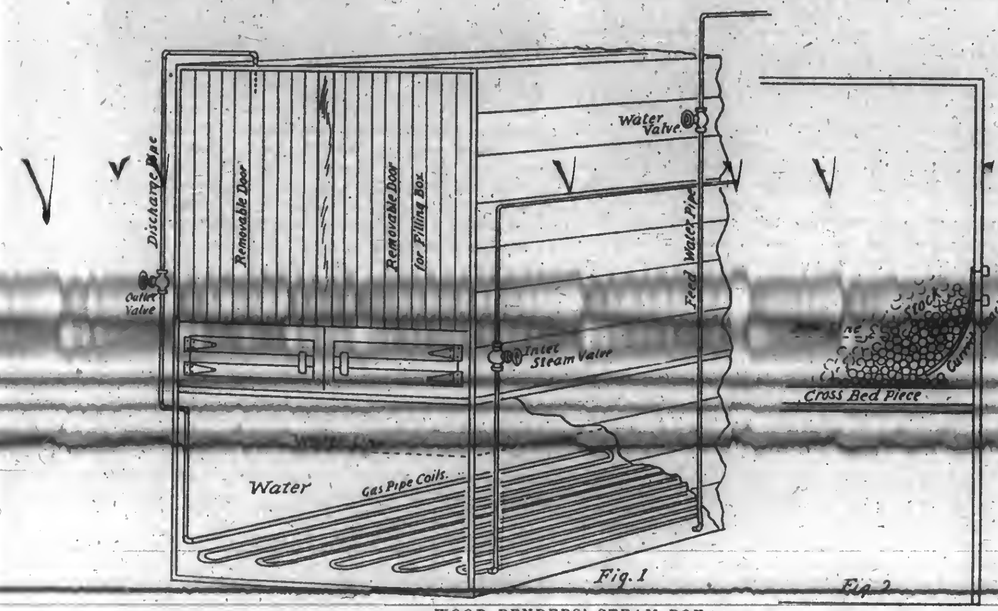
17. All sliding sashes should have metal shoes let into their edges.

18. The parting slips of sash frames are often of zinc inserted in a saw kerf in the head of the frame turned down and nailed on top.

From "Manufacturer", I wish to erect a steam box for bending wood as I have a lot of bent work to do, and would like very much to get some information regarding the proper way to construct a first-class apparatus for the purpose, or any other information you may think will be of use to me in connection with the subject of wood bending.

Ans.:—This subject is rather a large one and to discuss it with any degree of success would require several

pages of "The Canadian Architect and Builder." We may say however, that the following is the method adopted by the Austrians who are noted for their bent wood productions. The material to be bent is usually red beech, which grows very abundantly in the Hungarian forests. The timber is sawed into strips 1½ to 2 inches square, according to the work for which it is intended, and then turned in a lathe into smooth, round rods. These rods are placed in an air-tight case, where they are exposed for fifteen minutes to the action of superheated steam. They are then so soft and pliable as to be easily bent by hand, and are in this condition fitted to iron patterns, well secured, and left to dry. The drying takes from two to eight days, according to the size of the piece. When it is complete, the wood is detached from the pattern and is ready to be joined with other pieces, varnished, polished and sent out in the shape of finished furniture.



WOOD BENDERS' STEAM BOX.

A first-class steaming box was illustrated and described in *The Woodworker* some time ago, and we reproduce the sketch herewith and such of the text as may be useful to our correspondent. Viewing the matter of steaming woods for bending, there are two essential ends to be obtained. One is to be able to subject the wood to a proper treatment with steam to bring it to a pliable condition, while the next thing is to hold it in such state until it is ready to bend. In the sketch shown herewith, at Figs. 1 and 2, the plans depart somewhat from the usual, and have been changed so as to meet all the requirements as indicated. It will be seen that the sketch shows a double box, or a steam box, and a vat containing water, instead of a single box. This box and vat are supposed to come tightly together where the line indicates that they meet on the sides and ends, while the vat has no top, and the box is left entirely open at the bottom, except some cross pieces to support the stock when steaming, and thus becomes, practically, a single box on the interior, constructed to contain a certain quantity of water in the lower part. No doubt the illustration will clearly explain the idea, still, it may be better to say something in connection with it.

With this arrangement we obtain some very desirable ends in steaming and protecting stock that is to be bent. Instead of taking steam direct from the boiler to the stock itself, the plan is to use the steam from the boiler in the coil in the bottom of the water vat to generate what steam is needed for preparing the wood in the box above it for bending. To generate steam in one place in order to produce the same thing in another place may seem like a sort of second-hand arrangement. All the effect which the stock gets direct from the boiler is the condensed discharge from the outlet valve, which is carried to the top of the box and allowed to drip down through the sticks which are being steamed, as will be noticed.

Possibly it may appear to some that this device would produce a great flow of condensed steam in the outlet pipe, but this is not the case, for in reality this amount of outflow is surprisingly small as soon as the water has come to a boiling point, which requires but a very few minutes with even a low pressure of steam. It is absolutely necessary to place a valve on the inlet pipe, and the discharge pipe also, in convenient position, so that the person handling the stock from the box can regulate his vat to the most satisfactory condition of what he may desire to bend. None will fail to see that this provides for treating the stock in a different manner than where the steam is taken direct from the boiler and admitted at one point, which supplies such a driving application of high pressure steam.

This box has doors for the larger portion, which are apt to be removed for filling it, then placed back in tight position to remain there until the stock has been used in bending. Instead of allowing the escape of a great quantity of steam, as when a stock is taken out at the top of the box, we simply use the small door

at the bottom and remove the pieces from the underside of the pile, thus practically maintaining an equal condition of steaming throughout the whole box. The second sketch, Fig. 2, shows how to arrange the curved bracket by a circle attached to the side of the box to hold the stock in shape so as to be able to move one piece at a time, without any difficulty or inconvenience whatever. It must be borne in mind that the stuff at the bottom ot the pile, and nearest the water and fresh steam, are always in the best state for bending, so as it works down from above, each stick or piece comes under the same effectual treatment, which insures a uniformity of condition from the commencement to the end of bending a pile of stock.

A NOVELTY IN LAYING CONCRETE.

A rather novel method of laying concrete has recently been adopted by J. F. Lyman, of Modesto, Cal., in the construction of a concrete wall, according to the Stone Trades Journal. Between the framing forming the outer and inner faces of the wall collapsible hollow cylinders somewhat less in diameter than the thickness of the wall were placed vertically at intervals, the cylinders having previously been perforated with several holes. The object of this was to drain the water from the fresh concrete as the latter was placed round the cylinders. The concrete having been filled in round the cylinders, it was allowed to set during the night, and the water which had collected in the cylinders was then pumped out and the cylinders were withdrawn, the space which they occupied being filled with concrete. It is stated that the hollow cylinders contained from 2 in. to 6 in. of clear water at the end of from ten to twelve hours, the water having drained from the concrete. The object in providing this extra drainage was to procure a more uniform set throughout the mass of the concrete. It is also stated that concrete laid by this method is unusually free from cracks and very uniform in strength.—The Improvement Bulletin.

DURABILITY V. POROSITY.

It is generally held that the durability of a brick is in a great measure bound up in its relative degree of porosity. We do not object to this on the whole, but in many cases that have come under our notice the rule does not seem to hold good. We grant that if the brick-earth employed is thoroughly bad for weathering, both chemically and physically, the brick is bound to suffer materially, especially in a moist climate. But we know of many excellent kinds of bricks which are fairly porous, and yet stand the weather well. The fact is that, if the grains composing the porous brick are firmly held together by any substance that does not readily yield to atmospheric influences, the brick as a whole will stand well. No doubt the most durable brick is that in which the grains are held together by silica. But the maker of ordinary bricks for building purposes would find some difficulty in selling such for general work, though they would be in demand for the linings of certain kinds of furnaces, and the like. For furnace work—and in this we include brickwork directly in contact with ores that are being smelted, retorts, and the like—the chemical composition must be considered in relation to the class of ore to be dealt with. The relative acidity or basicity should be a matter of careful investigation, both so far as the bricks and the ore are concerned. For general building purposes, however, it is practically sufficient to see that the texture of the brick is close, and that when two of them are smartly struck together they "ring." This is an old-fashioned method, but no better one has yet been devised. If the brick is very porous it will not "ring."

MONTREAL NOTES.

The Domestic Architecture of Montreal has a history worthy of being written and illustrated at length and in detail. Even the primitive wood buildings in this Province have architectural qualities.

THE BEGINNING OF THINGS.

The illustration of a little log house shows the roof carried far out on the ceiling joists to shade the house-front and its little platform. The shingling as it works from the steeper roof to the flatter felt of the eaves develops a strikingly beautiful curve. In an hour's walk just outside Montreal one might see a hundred examples of this most natural economical and excellent arrangement. But it is a virtue which seems to blossom only in humility, for wherever the first sympton of pretentiousness show themselves one looks and finds that this peculiar grace is gone. Many of the buildings existing in the older part of the city date from the seventeenth century and for the most part these pioneers of civilization put to shame in the matter of solidity of construction the majority of their more modern confrères. Their obvious efficiency in warding off the elements, their cosy look and air of substantial well being, give them as pure architecture a similar superiority to most of the more recent work that with frantic and pitiful pretentiousness endeavours to make itself up with make-shifts borrowed and [illegible] from all times. As in the beginning of things the house of Montreal were of wood this stage cannot have lasted, and everybody who was anybody must soon have had a house of stone.

HOUSES AT VARENNES.

The old house at Varennes is a good type of the simpler eighteenth century dwelling of the province. The front is in this case of ashlar work, the gables random rubble carried well above the roof. In many cases these gable skews are the full thickness of the walls, or about 2'.0" broad and are shingled like the roof. In this house at Varennes may be noticed the almost invariable and picturesque form of footstone to the skew with its large projection to cover the overhang of the eaves of the roof, which is in this case more moderate than usual. The chimneys are here too of the favorite form—double with a lower stretch of horizontal

wall across the apex of the roof. The object of the great spread given to the gable, by its projecting footstones, high skew and broad chimney stacks, was apparently to give all the shelter possible not only to the house but also to the roof itself. The projecting quoins make good the connection between the ashlar of the front and the rubble work of the gable. The balustrade to the platform along the front of the house still has the old molded balusters. The square outbuilding with its pyramidal roof is a very usual adjunct to these old residences.

OLD HOUSE, ST. URBAN STREET.

The houses in St. Urban street, Montreal, show the same type of architecture as applied to the more crowded streets of the city. The masonry here is of a rough irregular ashlar. The footstones of the skews have the same molding as those on the Varennes house. The windows are very commonly constructed with a small projecting keystone over their centre. This custom evidently was suggested by the difficulty in handling or obtaining large stones and justifies itself as a constructive expedient by giving a certain elasticity to the structure preventing the unsightly cracking of lintels, difficult to avoid on treacherous soils. The rough ashlar house in Sherbrooke street may be

OLD HOUSE IN SHERBROOKE STREET.

more modern in date but follows closely the same type. Still later in date come houses of dressed and evenly coursed ashlar of which some here illustrated (No. 5) are also in Sherbrooke street. Houses of this class have a very considerable charm not readily exhibited by a photograph. They suffer from the fault common to most late Georgian and Adams work of being over restrained. They speak of a time when people set such store on refinement that from fear of expressing themselves with any appearance of vulgarity they hardly expressed themselves as individuals at all, and their architecture has an air of uniformity and conventionality. To a considerable degree of refinement it has, however, fair claim, and in Montreal it is happy in the use of the beautiful local limestone. The builders of this period handled this excellent material with a true instinct. Their delicate little mouldings, broad plain surfaces, and slightly projecting pilasters and bands exhibit the delightful grey tone of this material to perfection. The stone is so hard as to be somewhat refractory but this difficulty is overcome by the method of dressing locally known as fine boucharding i.e., picking with a very heavy hammer the square face of which is furnished with rows of sharp teeth. It is worth observing that the building which Messrs. McKim, Mead & White are now erecting, for the Mount Royal Club in Sherbrooke Street, the Montreal limestone is being used and the style of the building strongly recalls that of the period now being noticed.

OLD HOUSE IN SHERBROOKE STREET.

The old house on St. Gabriel Street [illegible] must

COTTAGE IN LANCASHIRE ENGLAND.

drawing appears in the present issue, is a variant on this extremely restrained type of work. Here may be observed employment of the small key block over the centre of the openings. The use of a kind of triglyph treatment with a Corinthian order

of pilasters is a naiveté not characteristic of the period, which as a rule exhibits a passion for correctnes.

The photograph of a little cottage in Lancashire, England may serve to show how kindred are the effects of true building instincts working far apart and with much difference of detail.

Scattered throughout the cities of Montreal and Quebec and in the Province there are many old buildings some of them of considerable dimensions and containing features of a more elaborate kind of interest than those here cited: A prize is now being offered in connection with the the Sketching Club of the P.Q.A.A. for drawings recording the old work in Quebec Province and in the Eastern Provinces. If the students interest themselves in this work we may expect much valuable and charming architecture to be brought within general knowledge. Most of even the simplest old work being stamped with a truly native character.

CONCORDIA SALUS.

DUNDAS QUARRY.

We show herewith views of a quarry which has just been opened by Doolittle & Wilcox, Limited, immediately east of Dundas

VIEW OF CRUSHER AT DOOLITTLE & WILCOX QUARRY, DUNDAS ONT.

station on the main line of the Grand Trunk, which is interesting in both location and equipment.

The workings are on top of the cliff 250 feet above the R. R. tracks, and 500 feet above Lake level. The top layer, 16 to 18 feet thick is an exceptionally pure hard dolomite, carrying Silica .28%, carbonate of Lime, 53.78% carbonate of Magnesia 42.00% Iron and Alumina 1.22%.

This stone is used for metalurgical work and as a flux, and contracts have been closed for supplying it to the Hamilton Steel & Iron Co. and the Lackawanna Steel Co., of Buffalo, to whom shipments will be made twelve months in the year, it is a fine concrete or macadam stone but is too valuable to be used for this work.

The next layer of stone 15 feet in thickness is harder but not so pure, carrying about 1.50% of silica, this stone is more suitable for concrete and macadam work, but cannot be used as a flux.

As hardness is an important quality in stone used in concrete work, the stone from this quarry was tested last spring by Mr. McPhail, Assistant City Engineer, of Toronto, with the following results:

Two blocks about 8½ in. x 4 in. x 4 in.—Original weight 27lbs. 3 oz.; weight after 1,000 revs. 26lbs. 6 oz., 3 per cent. loss; weight after 2,000 revs. 25lbs. 14½ oz., 4.7 per cent. loss.

The crusher which is placed just below the second layer of rock, in the building on the brow of the cliff shown in illustration No. 1, is a No. 7½ Austin gyratory, with a capacity of 1000 tons per day of 10 hours. It is belted direct to a 100 h. p. Westinghouse alternating current motor which gives ample power to develope the full capacity of the crusher.

From the crusher the broken stone is delivered through the chute to a revolving screen located in the building on the hillside. This screen is 48 inches in diameter and 20 feet long, and is provided with a dust jacket 60 inches in diameter and 10 feet long. The screen is geared direct to a 15 h. p. motor and is large enough to handle the full output of the crusher.

The bottom of the screen building contains bins 25 feet deep, 43 feet long and 32 feet wide, divided into five compartments, giving a storage capacity of 2,000 tons.

From these bins five chutes lead to a central chute. which delivers stone into cars standing on a track scale as shown in plate No. 2 so that any combination of sizes required can be loaded at will.

The perforations of the screen and size of stone made are as follows: 1st. Smallest hole ⅜ in., materinl passing through this is known as dust; 2nd. stone passing over ⅜ in. and through ¾ in. known as ½ in. stone; 3rd. passing over ¾ in. and through 1¼ in. hole known as 1 in. stone; 4th. passing over 1¼ in. and through 2¼ in. hole known as 2 in. stone; 5th. passing over 2¼ in. and through 3¼ in. known as 3 in. stone; 6th. passing over 3¼ in. known as 4 in. stone.

As soon as sufficient space is cleared at top, the carts shown in plate 3 will be replaced by dump cars running on rails which will deliver direct from quarry face to the crusher. This track will be circular and loaded cars will be drawn from one end of the working face to the crusher, and when dumped will be placed empty at the other end of the working face to be filled.

It is also expected that electric drills will be installed to replace the steam drill shown, and in this case the quarry will be operated entirely by electric power, making it so far as we know the only one so operated on this continent.

Those familiar with quarry work will appreciate the advantages of this plant in simplicity of machinery, and freedom from

flooding or snow blockades; also in its avoidance of the troubles entailed in operating a steam plant at a distance from coal or water.

The Rogers Supply Co. will handle this stone in Toronto and will stock it at the various yards of the Rogers Coal Co. throughout the city.

Doolittle & Wilcox, Limited, also own and operate the Rymal Quarry, with a capacity of 250 tons and a slag plant at the

SCREEN BUILDING—DOOLITTLE & WILCOX QUARRY, DUNDAS, ONT.

blast furnace in Hamilton with a daily capacity of 500 tons. The Dundas Quarry being as stated, on the main line of the Grand Trunk Railway, with three way trains daily between [illegible] the very best.

EXPLAINS CONFUSION AT BABEL.

"Among ignorant persons," said Frank E. Wallis, secretary of the Architectural League of New York, "there is a belief that architects are useless—that a builder is enough of an architect for all practical purposes. I attended a session of court not long ago when an architectural case was being heard. A young architect was put on the stand, and, after he had given his testimony, the lawyer for the opposition began to cross-examine him. The questions ran like this:

"'You are a builder, I believe?'

"'No, an architect.'

"'Builder or architect, architect or builder, it is much the same thing, isn't it?'

"'No, not at all.'

"'What is the difference?'

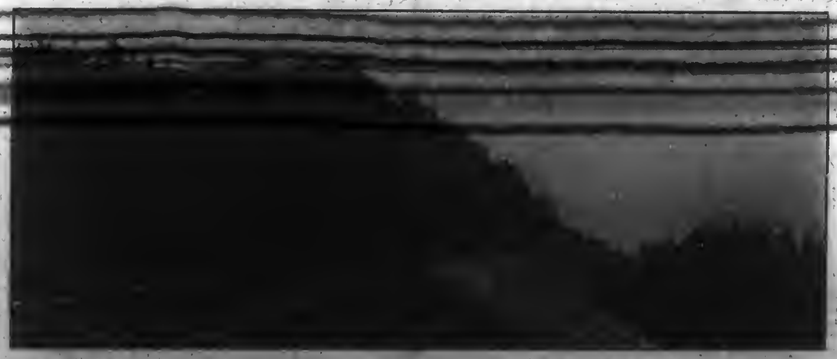
"'The young man explained what the difference was, and the lawyer, with a sneer, said:

"'Oh, very well. That will do. And now, after your very ingenious distinction without a difference perhaps you can inform the court who was the architect of the Tower of Babel?'

"'There was none,' he answered, 'and hence the confusion.'"

HEATING APPARATUS AND BAD ODOURS.

In consequence of complaints respecting smells arising from the use of hot pipes for heating purposes, Professor Nussbaum has, according to the Gesundheits-Ingenieur of June 10, been let to carry out a series of observations extending over several years into the character of the dust deposited on the pipes used for the distribution of hot water or steam and into the products [illegible] temperature reaches 70° C. this dust begins to become decomposed and that between 75° and 80° C., such action goes forward with great rapidity. The smell complained of resembled that of a stable and is due to the chemical action of the particle of organic matter which forms a large portion of the dust deposited in dwellings and public buildings. In the course of certain experiments here described, ammonia was freely evolved from the dust when the temperature rose to 80° C. It has been previously observed that the smell was always worse when the heating apparatus was used for the first time after a long interval of rest, and when the cause had been discovered and the dust was carefully cleared away the smell partly disappeared, though some smell, due to floating dust in the atmosphere, remained. When the surface of the pipes is damp, decomposition takes place at lower temperatures than when the dust is perfectly dry. —*Times Engineering Supplement.*



GENERAL VIEW OF DOOLITTLE & WILCOX QUARRY, DUNDAS, ONT.

Among the quieter satisfactions of life must be ranked in a high place the peace of a man who has made up his mind.—Anthony Hope.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.
32 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so they should send old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	S. G. CURRY, "
2ND VICE-PRESIDENT	W. A. LANGTON, "
TREASURER	HENRY SIMPSON, "
REGISTRAR	W. R. GREGG, 96 King St., Toronto

COUNCIL:

[illegible]	To[illegible]
J. WILSON GRAY	"
JOHN E. BELCHER	"
	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	[illegible]
1ST VICE-PRESIDENT	J. S. ARCHIBALD, Quebec.
2ND VICE-PRESIDENT	[illegible]
SECRETARY	R. P. LEMAY, Montreal
	D. R. BROWN.

P.Q.A.A. COUNCIL.

JOS. VENNE	Montreal
H. W. DAVIES	Montreal.
E. M. ST. CHARLES	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DUTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, Jr.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY,
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNEY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer, 478 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. COOK, President.
R. A. CARTER, Secretary.
H.A. BELL, Treasurer.
T. BRADLEY.
C. P. SKINDLE
K. M. FRASER
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President. T.D. ROBINSON, Treasurer.
G.BUREAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: T. G. Latimer, H. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alaip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girolm.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAMER, Hon. Treasurer.
J. HERBERT LAUER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY.
GEO. H. HOOD.
Past Presidents

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTOLS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE, Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. z COTE.
LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

THE T. EATON & CO'S. STORE AT WINNIPEG.

The new departmental store at Winnipeg was opened on July 16th, ten days less than a year from the day on which the first sod was turned for its excavation. The day for its opening was fixed from the start and the time was kept.

The building has a 266 feet frontage with space in the block to double that length when needed. The building is five storey in height [illegible] foundations and steel framework [illegible] said to be calc[illegible]le this height.

The [illegible] is perfectly utilitarian; vertical and horizontal [illegible] protection, and the remaining surface all glass. There are nevertheless 1,000,000 bricks and 7,000 barrels of cement included in the structure.

Automatic sprinklers are installed within the building and a water screen without. To feed these there is a private well and two pumps of a capacity of 3,000,000 gallons a day.

The most modern equipments are arranged inside: a rest room, fur-checking room, counting room, public telegraph and telephone stations, and a bureau of information regarding trains.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

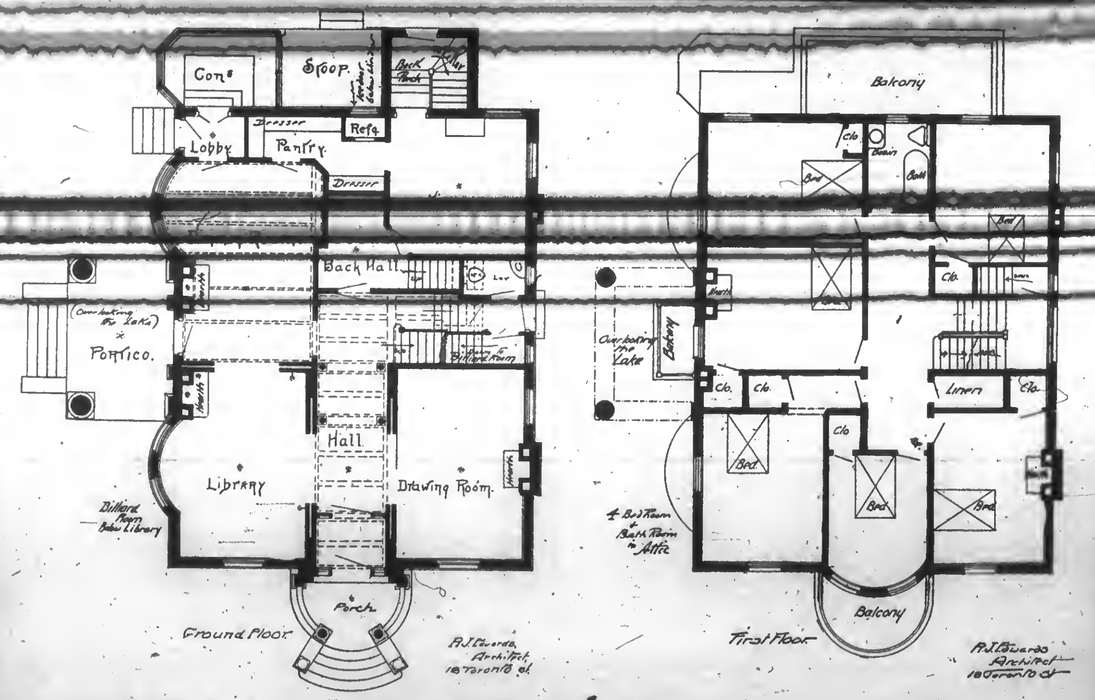
IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

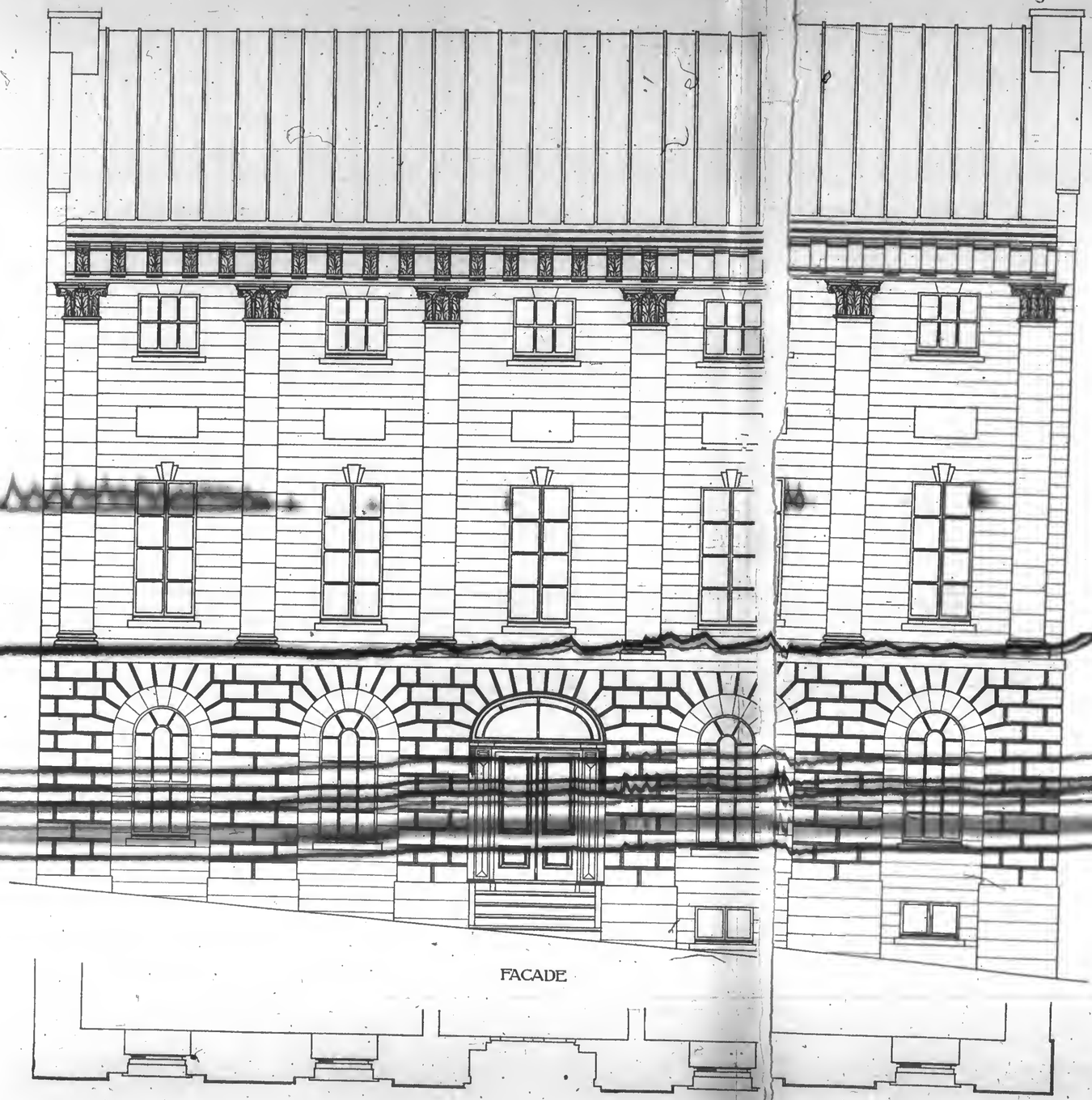


SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1905

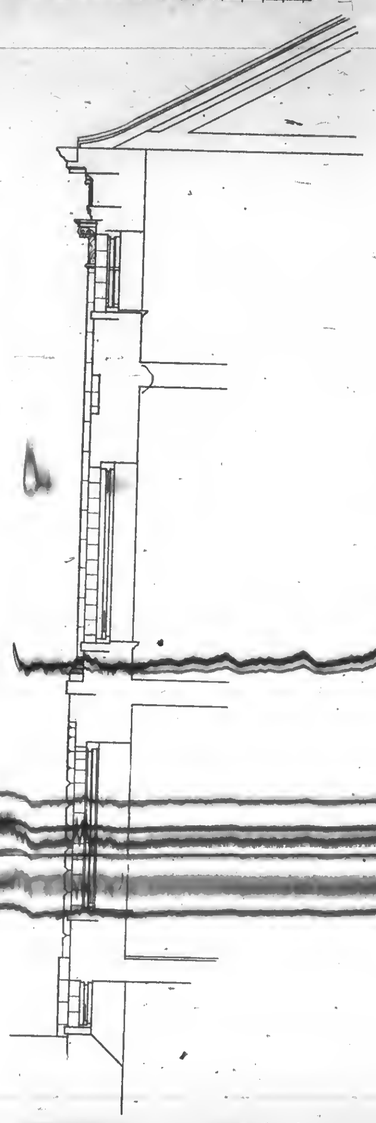
HOUSE IN JAMESON AVENUE, TORONTO
MR. R. J. EDWARDS, ARCHITECT

OLD HOUSE IN ST. GABRIEL STREET, MONTREAL.

Scale 0 5 10 15 feet.



FACADE



SECTION

Cecil Scott Burgess
Mens. et Delt. 1904

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1905

REBUILDING THE BURNED DISTRICT IN TORONTO.
WAREHOUSES ON BAY STREET.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1905

REBUILDING THE BURNED DISTRICT IN TORONTO.
WAREHOUSES ON BAY STREET.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1905

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 212. AUGUST, 1905.

ILLUSTRATIONS ON SHEETS.

Club House for the Royal Canadian Yacht Club on Toronto Island; plans and a View.—Messrs. Sproatt & Rolph, Architects.
Cheap Cottages from English Sources.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

View of the Royal Canadian Yacht Club House, Toronto.
Interior Views of the Royal Canadian Yacht Club House, Toronto.

CONTENTS

Editorial	113-114	Reinforced Concrete Roundhouse, Toronto	124
Garden Cities and Suburbs	115	Montreal Notes	125
The Blank Side of Tall Buildings	116	The Living Room	ii
The New Trinity Building	116	Wooden Water Pipes	iv
Our Illustrations	117	Time-Proof	ix
Book Review	118	Artificial Stone Coloring	x
Sand-Lime Brick	119	Oxford Art Lectures	xi-xii
Rules for the Testing of New Materials in Construction	119	Hardwood Snpplies in the United States	xiii
Specifications of Fire Escapes	120	The Noblest Art	xiv
Curing Concrete Blocks	121	How Would You Like It	xiv
Intercommunication	122-123	The Canadian White Company	xv

The Sanitation of Muskoka.

The Ontario Board of Health held its quarterly meeting at Port Carling in Muskoka, and made a tour of inspection in the lakes to consider the question of their preservation from unsanitary influences. There is but one thing to general sanitariness, not only in these lakes but in others of our numberless lakes which are surrounded by camps and cottages with a summer population. The danger lies in the defilement of the water, and safety is in the general understanding that nothing should be thrown into it. The lake is the proper place for the disposal of wastes. [illegible] buted on or under the surface of the land. There may be agencies in the water as [illegible] eat up impurities, but man, who is not one of them, cannot avoid taking part in the work, where the water is concerned, whereas he can avoid it on the land. There should be a public opinion created as soon as possible against throwing things into the water. Not only drainage, slops and laundry water, but other refuse of all kinds should be kept out. The Muskoka Lakes' Association and other clubs of the kind should supply information to their members as to the best methods of sanitation about the house, in simple and in elaborate camps. The Board of Health is always ready to give information on the subject. And there are books (such as that reviewed in this number) which treat of the matter. There is no reason for ignorance. As summer camping is a national fashion with us it ought to be national forte.

Taking Pains to Come Under a Boycott.

There is an advertising sign set up on a little island in the Lachine Rapids, which attracted the attention of a Press party from the United States, who did not rest until they had gone to the manufacturers of the article advertised to find out how the advertising board was set up there. Having heard an account of the act of heroism by which the sign was conveyed to the island, the members of the Press party soon made copy of the story, with the comment that "this spirit of initiative does credit to the advertising department of the ———— Company." On the principle that every man must do his best according to his light we cannot refuse to commend the advertising department, the Press party, and all concerned; but we wish them more light. How, for instance, would a Lachine Rapids full of signs of the unnecessaries of life appeal [illegible] excursion? The pluck of the men who put up the sign [illegible] risk of their lives? Fortunately they came back safely, but it is fortunate also that an upset that washed them up on the island—boat, sign and men in separate parcels—so nearly brought "the fever called living" to an end with them that the initiative of that advertising department may perhaps be no further followed.

Municipal Testing Plants.

In another column will be seen a set of rules adopted by the Bureau of Buildings for the Borough of Manhattan for testing the acceptability of new building materials. It is not stated how far the proposed test will be applied to materials other than those used in buildings erected for the municipality. But it seems a reasonable thing that, since the field of invention has extended to building materials, a municipality should be in a position to decide whether new materials that it is asked to authorize will fulfill the requirements of its building law. It is not enough that its officials should be in a position only to shrug their shoulders and point to a by-law which takes no account of novelty. There

is testing done already by municipalities. Since cement and asphalt came into use, the means of testing the quality of shipments of these materials is a necessity for every municipal engineer. It is only necessary to extend operations so as to meet the needs of the department of buildings. To the machinery already in use for applying tensile tests it would be necessary to add only machinery for compression. Arrangements for the application of heat or cold are easily made or extended.

It would not involve much work to test all new material. But another class of testing is suggested which is really another question. The anxiety that surrounds the use of cement would dissolve before certainty that it had been all tested. This seems too great an undertaking to be assured. But it is not so impossible as it seems. One output of a cement mill does not vary much in quality and it amounts to many car-loads. One test per carload is therefore sufficient. And it is conceivable that all the carloads that enter a city might receive the municipal test at a charge to the dealers in cement which would add inappreciably to the cost of cement to the consumer.

To Control the Effect of High Building.

A tall building is a pleasant abode when its windows look out freely to the sun and air; it is not so pleasant nor so wholesome as an abode when its windows look into a tall well. There is still another stage, when windows which once looked out on the sun and air are blocked by the contact of another tall building that has risen on the adjoining lot and all offices on this side must be lighted by artificial light and get their air from the passages. This is looking at the question from within. Viewed from without, tall buildings at intervals make a picturesque street and one that is not unsanitary; rather, one would say, the varied heights and fields of surface must vary in temperature so as to increase the movement of air. And the sun is not excluded from the streets to an injurious extent. But, [illegible] transformed into narrow clefts which it cannot be good to live in. From all points of view then it is desirable [illegible] would be served by this; the streets would look fine and would be habitable, and the buildings themselves would afford the greatest satisfaction to their occupants and the greatest value to their owners.

The question is how this desirable condition is to be reached. Obviously permission and restriction, as regards building high, cannot be dealt out alternately to owners of property along the street. The only way, and this is quite possible and quite reasonable, is to require that companies, proposing to erect buildings above a certain height, shall acquire enough land on either side to provide for the proper clearance of their upper storeys. Tall building therefore would always have the form of an inverted **T**. The top of the horizontal member would combine the functions of cornice line for the street and crowning member for the base of the tall portion of the building. The street composition, which in its abstract form may be represented thus **⊥⊥⊥**, has an illustration in the concrete in the lower part of Broadway, New York, where the accidental collocation of a couple of tall shafts with a three-storey bank between (its cornice running with their base cornices) shows how fine, and how consistent with a Parisian nicety of street design, such a system of building would be. Its justification on this ground alone might not obtain an easy recognition in Canada, but the practical advantages to both building owners and the public are of a material kind and are obvious.

Danger in Alterations.

The collapse of floors in the Meyers department store, at Albany, is an instance of a kind of accident that has happened before. The only wonder is that it does not happen oftener. According to the newspaper accounts a gang of Italian workmen were removing an iron column under the ground floor. They had propped up the floor, but evidently the means of support were insufficient, for, as soon as they loosened the column, down came all three or four floors over an area "fifty feet in radius", (the newspapers say), in the centre of the building. The accounts survivors give of how they noticed things slide off the counters, as the floors began to cave, is graphic and horrifying. Attendants slid down in the same manner into the gulph. The actual extent of the disaster, as regards loss of life, was not apparent until the ruins were cleared away, and this process seems to have outlasted the interest of our newspapers. The indications were, however, that the loss of life would be unexpectedly small. For one thing the accident happened immediately after the day's work began. But it might have been otherwise, and may be otherwise on some other occasion when alterations are being carried on in an occupied building. If in this case the work was being done with proper precaution, as one would think likely in a building of so much importance, the result only emphasizes the difficulty of keeping clear of danger in altering existing work. Yet in this field the "practical man" is paramount, and often shows his practicalness by the way [illegible] harm. Once in a way an accident happens, but not always while the work is in progress. Some time after- [illegible] cutting, too wide trimming, too long a span—some condition of affairs that at first hand, when the building was in process of construction, would not be thought of for a moment. When the building has stood for some time, its coherence, which experience shows is actually the greater for the setting and settling together of its parts, seems much more difficult to upset. Then the man with a saw in his hand, that one sees performing internal operations on floors, has a confidence in the mutual support of the parts of a structure which, however remarkably it is justified in experience, does not make for the safety of the public. He may at any time meet the special case which requires a special analysis if it is to be handled with safety; and the habit of mind that is likely to give this analysis is not his habit of mind, that of the practical man whose readiness to do is based on assurance, so much as that of the scientific man whose only certainty being demonstration always starts from the point of doubt. It is this latter kind of workman—the architect or engineer—who should be in charge of structural alterations in most buildings and certainly in occupied buildings.

GARDEN CITIES AND SUBURBS.

Many movements, indeed most movements, which find their field for working out on this side of the Atlantic, will be found to have their origin in England. The Garden City and Garden Suburb projects will no doubt turn out to be one of these steps forward in modern life.

Two years ago, as a consequence of a book promulgating a Garden City Scheme, a large area was purchased in Essex by a company of philanthropic investors and called Garden City. It was opened with some ceremony and is now in process of development. Since then, in the course of this year, a second project has been started at Hampstead under the name of the Hampstead Garden Suburb.

Since the time of the Tudors, Eton College has owned an estate of 320 acres, adjoining Hampstead Heath and making part of a celebrated view. Hampstead Heath is to have 80 acres of this estate and the rest at a price of £470 an acre, has been handed over to Mrs. Barnett, (wife of the clergyman who established Toynbee Hall, the University Settlement at the east end of London), and a committee of public spirited noblemen and gentlemen, under the name of the Garden Suburb Trust.

These schemes are the outcome of a tendency to seek the country for residence which is just as marked as the tendency to seek the city for work. The very flow towards the city is that which, by increasing the density of its population, makes it undesirable as a place to live in and causes the counter-flow towards the country. To this end electric railways and motor conveyances contribute, so that suburban residence is a natural state of affairs now-a-days.

The suburbs themselves are, however, seldom satisfactory as a refuge, either in London or on this side of the water. They are compounded of building speculations in which, in so far as the speculators think of beauty at all, they think of it only as it affects their [illegible] There is no general design, only more streets added to the town. There is no difference from the rest of the [illegible] is no variety of public and private space; no composition of functions, or classes; but long strings of houses, all of the same kind.

Garden City is as far from this as possible because it is a complete town in itself. Even factory sites are included. It is distinctly not an attempt to get "back to the land", or to realize again any condition of affairs that is past or belongs to other situations; but is a proposal to make an ideal city with the existing conditions of town life; a purely artificial creation, beginning with vacant land. Without doubt, as the place is only an hour or so from London, there will be many residents who will go to London to do their daily work; but Garden City will have a life of its own, and will acquire interest thereby.

The Hampstead Garden Suburb is more directly in the line of suburban development. It is a true suburb and, though there is public spirit at the bottom of the scheme, it is not intended to be in any way a gift, but will be as truly as the builders' work a speculative venture. The one point in which it is peculiar is that a good piece of land will be developed on a plan, so that profit will not be separated from the amenities. Here is the Times' account of the intentions of the trustees:

"Plans have been prepared for the treatment of the whole estate, with a view, not to covering it with the greatest number of houses, but to preserving the best features of the land, giving every house a pleasant prospect, interspersing buildings in every part with public open spaces and private gardens, and providing houses adapted to every pocket. On one of the best sites will stand a group of public buildings, a church, a chapel, a public hall, a public library and picture gallery, and a club. Schools and school playing fields will find their proper place. In one spot a piece of water will be the central feature; another part of the ground slopes down to a running stream. In addition to houses of all sizes, from the large villa overlooking the Heath to workmen's cottages, it is suggested that quadrangles of chambers or flats should be provided for single men and women, where some joint management may relieve the inmates—the old as well as the young—from the cares of individual housekeeping. The existing timber will be carefully preserved, and all the roads will be planted. Nowhere will nature be shut out; within sight of every house will be waving trees and pleasant greensward. If only the ideas of the Trust can be realized, there can be no doubt that, in place of the dull builders' roads and rows of monotonous cottages which are the common feature of the suburb, a very agreeable quarter will have been added to this gigantic and ever-extending metropolis."

This seems a good deal to get into 240 acres but the laying out must be done compactly in order to pay, and the scheme will not be realized as an ideal unless it does pay. As the *Times* says, "it will be necessary to form something in the nature of a [illegible] and the problem will be that of the ordinary development of a building estate, with this difference that the regulations and conditions which are of the essence of the scheme may somewhat postpone the realization of profits, while eventually they will largely increase the [illegible] prepared to arrange easy terms of payment." This is an essential condition of carrying out any largely conceived scheme. The initial expenses in the way of [illegible] returns—to say nothing of experiments which, in a first venture, may not succeed. But in no long time an estate laid out in this manner, in the neighbourhood of London or of any large city, must become valuable.

The exact conditions of development—whether the company should itself undertake building operations, and how far it should keep control of the land—are a matter which may receive different decisions in different places. In London the building lease is in common operation and seems a sufficient means of maintaining the peculiar character of such an estate.

The success of this scheme is of much wider interest than as it applies to the preservation of Hampstead and the amelioration of life in London. It is a common complaint of early residents in outlying districts of a town that the beauty of neighbourhood which attracted them and makes the charm of their homes is destroyed by the haphazard growth of building about them. This might be prevented by concerted action in the acquisition and control of land to preserve features and

characteristics, which are at the bottom of the neighbourhood's attraction. If, as it seems, this is the day of large dealings, here is a field for the application of the principle. Building schemes already extend beyond the mere edifice to the grouping of buildings and the planning of precincts and even districts. The Garden City and Garden Suburb schemes are no doubt a consequence of the Port Sunlight and other ideal settlements which, did not themselves aim at direct commercial success ; and a successful undertaking on ordinary lines will be sure to lead the way to further openings for not only does the setting of private residences demand larger treatment, but "housing questions," which occupy so much public attention, are more easily treated as part of the growth of a district than as an isolated scheme.

THE BLANK SIDE OF TALL BUILDINGS.

The prominence of monotonous side walls in New York does a great deal to mar the effect of the skyscrapers, not only from the unpleasant suggestion of skin-deep beauty which they give to the rather over elaborated fronts but from the perpetual suggestion of unpermanence, which is of all things the most hostile to architectural effect. There is evidently an anticipation of change. The blank side is more than unencroaching ; it shows an expectation of encroachment ; so imminent that it is not thought worth while to finish that side.

No. 60 Wall Street, New York.

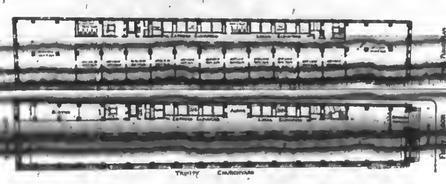
Messrs. Clinton and Russell, have, in the erection of No. 60 Wall street, offered a good suggestion for finishing these too prominent sides which does away with the crude appearance and suggests no more than the restraint of projection on the side of a neighbouring lot. The idea is not entirely new in New York but it is here conspicuously well carried out. The material is only brick, dark and light. The illustration takes no account of a difference in costliness of material between the front and side and in that respect perhaps suggests more than the actual building would the possibilities of colour design for tall buildings.

Proportional projection to emphasize the top of a tall building is out of the question. The substitution of superficial area of ornament for its projection has already been made in this part of the building, but is still unsatisfactory because of its meaninglessness. There is no actual motive for the upper ornamentation but that of covering a certain area with encrustation, and the ingenuity required to combine sufficient features to produce the required result is a piece of draughtsman's work that is not impressive, even when largely done, because of its very ingenuity ; because, that is to say, the actual construction does not, we know, suggest anything of the kind. There is indirectness about the way of getting the necessary ornamentation. Apparently there are colonnades, arcades, rows of pedimented windows or what not, and to these our attention is directed. We ourselves discover what is the real design—that all this enrichment differentiates the upper division of the building so as to make of it a crowning member of the composition.

It would be more forcible to differentiate the upper member in a more direct manner, by some means that would be used obviously for that reason and for none other. Ornamentation by colour would be such means. It is rational because it can be done on the scale necessary for being seen from the street level—which colonnades and canopies, proportional in themselves, cannot be. How the two methods compare can be seen in the above cut of 60 Wall Street, in which the flat side, with some assistance from string courses and a gable, competes not badly with the front.

THE NEW TRINITY BUILDING.

The new Trinity Building runs through from Broadway to Trinity Place, a distance of 265 feet, but is only 47 feet wide at the widest end. It rises 21 storeys or about 290 feet. With the exception of end rooms, or rather spaces for subdivision, the offices have no exposure to the street but, looking into the comparative safety of Trinity Churchyard have polished glass windows. On the street side, which is occupied almost entirely by elevators, lavatories, booths, etc., the windows are filled with wired glass.



The steel work is protected by hollow tile fireproofing. The floors have 10-inch flat arches, end construction, with 2-inch soffit protection. The roof is 3 inches thick and the partitions are 4 and 6 inches. All columns and girders are furred with 3-inch blocks. The east, south and west walls consist mainly of 2- and 3-inch furring on terra cotta. The north wall (Thames street side) is a brick curtain wall. The stairways are enclosed in hollow tile partitions with tin-clad doors at the openings. The elevator shafts are enclosed in grillework backed with wired glass. There is a great deal of bronze work in the halls and corridors, and wood trim in mahogany treated to render it fire retarding. The above details are taken from *Insurance Engineering*.

Gold of all decorative materials requires good taste for its proper use. It may be used lavishly for magnificence or sparingly for refinement ; a middle course produces only dullness, an expenditure of material without result.

OUR ILLUSTRATIONS.

ROYAL CANADIAN YACHT CLUB HOUSE, ON THE ISLAND, TORONTO.—MESSRS. SPROATT AND ROLPH, ARCHITECTS.

The plans of this building, reproduced in our illustration sheets, were intended to be reduced one half, but are a little over 1 ft. to 1/16 in. The Yacht Club grounds on the Island consist essentially of a perfectly level bowling green fringed with trees, lying, not many feet above the water level, between the front of the island, on Toronto Bay, and one of the lagoons which run up into the island, on the bay side, and give it such an extent of shore line and of water surface in its interior. In every direction there are beautiful views ; so much so that in order to give a full conception of the Club House, site and all, it would be necessary to devote as much illustration space to views from the Club House as to the building itself.

The question of placing the house on the grounds was not without complications. The architects, in their original sketch placed the building with its back on the lagoon (which is to the left of our views) and the front facing the bay, looking over the bowling green to a panoramic view of Toronto across the water, with the yachts in the foreground to give perspective to its distant masses. This was abstractly the right position and pleased the yachtsmen ; but the bowlers, who are important users of the club, thought it desirable to have the building placed so as to give more space to the bowling green and let the verandahs overlook its length. The building is thus placed end on to the bay and fronts upon the greatest extent of lawn. This site gives the building the best chance to be seen to advantage from the land, and it extends its length across the end of the lawn, with great dignity. The essential excellence of Mr. Sproatt's design is the way in which he has avoided the scaffold appearance of a double verandah by treating the verandah solidly in detail, and by bringing forward to its face the central motive of the porch and the substantial end pavilions. The verandah is the building ; and it ought to be so, for the building is [illegible] in this connection, that there is no special entrance and nothing in the form of a door. All the windows open down to the floor, and all are equally a means of entrance from the verandahs to the club-rooms which give upon them. The dining room windows, which open down to the floor also, have their exit to a sodded quay about 10 feet wide, which is not shown in the plan but forms the shore line at that part and is the cause of the cant given in plan to the dining room. As may be imagined the dining room has a refreshing look-out for a summer evening. The quay outside the windows, being below the floor level, hardly appears ; only the tree trunks in the foreground give a hint that the water, which fills all the view from the windows, does not come up to the wall of the house. There is a picturesque view along this side of the house, and from the end of the dining room which lies on a point of land overlooking the lagoon.

The ladies' room shown above the dining room is for the use of guests. Besides the dinners in summer, one of the great functions of the club is an annual ball, for which the large club room upstairs has a floor prepared. This room, which is 81 ft. long by 25 wide has an open timber roof of queen-post trusses filled in for enrichment with additiona posts. To light and ventilate this roof is the function of the dormer windows on the front. For the sake of economy the roof has neither purlins nor rafters. It consists only of principals and boardiog; but the boarding (to carry the span) is 3 inch planks, tongued and grooved. To these the shingling is nailed. The roof and all interior woodwork (including the furniture) has a dead black finish.

To return to the exterior. There is no doubt of its success as a piece of design. Though but just completed it has the extraordinary effect, conveyed by all good work, of belonging to its place and having always been there. But how about the abstract problem, the design of a wooden building? There is no question but that Mr. Sproatt has bilked that question by keeping all the meanness of his wooden walls in the shadow of his massive verandah with its unconstructional stone proportions. The only place where the wooden wall appears is in the subordinate extension for the locker room; and here he has projected a pergolic trellis, as an invitation to the club to train up a vine and let it overhang the clap-boarding, to give some character to a wall which, from the material of its construction, lacks it. The club had better accept this invitation; it will suffice for the purpose. But as a demonstration of how a good designer feels towards wood as an architectural material this expedient amounts to an expression of opinion that it is inadequate.

CHEAP COTTAGES.

We have had applications for designs for cheap cottages and propose to devote a page of our illustration sheets as often as we can to this type of work. It is not easy to procure good designs for cheap houses. The cheap house is neither easy to make attractive nor is its design usually in the hands of men who have the greatest gift in that direction. We are making an effort to get some original designs but in the mean time have received some English designs which deserve fuller notice when we have space. The housing question in England has a rural side which [illegible] a good deal by agitation of [illegible] the agricultural land owner, under the county building laws, more to build a cottage than the [illegible] afford to pay in rent. The result is an added impetus to the movement from the country to the towns that is so deplored by Englishmen, and, after the usual correspondence in recognized organs, by means of which the English nation has a way of going into committee of the whole, it was decided that a cottage costing about £150 was the desideratum, and an exhibition of such cottages has been held in the most effective way by building about a hundred of them as permanent structures in the Garden City. From this exhibition we select this month one design which seems practical—a pair of cottages by Geoffry Lucas, A.R.I.B.A. The cost in England was about $2,000 for the pair. We should require to raise them a little above the ground and have a partial excavation and a porch. It is highly probable on the other hand that we should omit half the flues, though it would be better to leave them to help the circulation of warm air.

The front rooms are 14′ 6″ × 10′ 6″ with a kitchen or living room behind of the same length and 10′ 7½″ wide. The ingenious arrangement by which the

stairs occupy a narrow strip of space in the middle of the house is interesting. The scullery is 6′ 6″ × 5′ 6″. The height of this floor from floor to ceiling is 7′ 6″. The bedrooms are 14′ 6″ × 8′ 3″, 12′ 9″ × 7′ 3″, and 9′ 9″ × 7′ 10″; and the ceiling height (maximum) is 10′ 0″. The walls are of 9-in. brick; the roof is tiled. The ground floor is concreted, with wooden sleepers and floor over it. The windows are mostly double hung, and, as the illustration shows, have not the wretched expedient for cheapness of opening only at the bottom.

Our second illustration is of a cottage, not a portion of the Garden City exhibition but also apparently actually built for less than £300—or $1,500—the pair. The illustration was supplied to the Country Gentleman's Estate book by Mr. J. M. Hotchkiss who gives a full list of the items of cost saying they are "what I have paid and am paying." The figures are worth giving, not so much from their value as a guide to prices here as that the list of items is equivalent to a specification and shows the quality of the work.

	s	d	£	s	d	£	s	d
Excavator and Drainer.								
24 cubic yards, Excavation, etc	0	8	0	10	0			
7 yards 3-inch Field drain	0	3	0	10	0			
2 connections to pull pipes	2	6	0	5	0			
97 yards 4-inch Glazed Socket drain	1	0	1	17	0			
2 Gullies	1	6	0	3	0			
7 yards 4-inch C. I. Veot pipe	2	0	0	14	0			
2 outlets to drains	5	0	0	10	0			
						4	14	0
Bricklayer.								
24 yards 14-inch Walling, including footings	7	0	8	8	0			
165 yards 9-inch Walling, including footings	5	0	41	5	0			
50 yards 9-inch Walling (measured solid in chimneys), including forming flues, etc.	4	0	10	0	0			
80 yards faced concrete floors, including 6-inch thick under 4½-inch walls	3	0	12	0	0			
100 yards 2½-inch Walling	3	0	15	0	0			
4 Concrete hearths	2	0	0	8	0			
7 lineal yards 14-inch Damp course	0	5	0	2	11			
" 9-inch "	0	3	0	1	6			
" 4½-inch "	0	1½	0	0	6			
36 lineal yards Cement flashing to [illegible]	0	6	0	18	0			
70 square yards Brick on edge in half-timbering	2	6	8	15	0			
2 Cottage ranges	60	0	6	0	0			
4 Bedroom grates	7	6	1	10	0			
2 Washing pots, grates and doors	12	6	1	5	0			
						107	12	5
Carpenter and Joiner.								
60 cubic feet Timber, machine dressed, in floor joists	1	9	5	5	0			
7 squares, Labour and nails, in do	3	6	1	4	6			
800 square feet 1-inch Flooring boards	0	1½	5	0	0			
8 squares, Labour and nails	5	0	2	0	0			
100 cubic feet Timber [illegible] (allow for haulage, sawing, etc.), per cubic foot	1	0	5	0	0			
240 Mortises and tenons [illegible]	0	9	9	0	0			
[illegible]	1	0	1	0	0			
28 cubic feet Timber, and framing [illegible]	1	0	2	2	0			
9 squares, Labour and nails in do	5	0	2	5	0			
80 cubic feet [illegible] in roof	1	6	6	0	0			
13 square yards [illegible] Labour and [illegible]	6	0	4	10	0			
20 cubic feet Timber [illegible]	1	6	1	10	0			
4 [illegible]	3	0	0	12	0			
12 lineal feet Barge boards, complete	0	6	3	6	0			
30 lineal feet Eaves boards, complete	0	3	0	10	0			
42 Stairs, complete [illegible] at per tread	4	0	5	4	0			
2 Front doors, complete	30	0	3	0	0			
2 Back doors, complete	22	6	2	5	0			
18 inside doors, complete	17	6	15	15	0			
164 square feet Windows, complete	1	6	12	6	0			
50 square feet Cupboard fronts, complete	0	7½	1	11	3			
124 lineal feet 11-inch by 1-inch Shelving, complete	0	4½	2	6	6			
2 Morrel's ash closet, fixed complete	100	0	10	0	0			
240 lineal feet Skirting strips	0	3	3	0	0			
2 Shelves to kitchen mantel	—		1	0	0			
2 Pot lids, etc	—		0	10	0			
						106	6	3
Slater and Plumber.								
170 square yards slating	3	6	29	15	0			
58 lineal feet Ridge	0	6	1	9	0			
56 lineal Eaves gutters, including specials	0	5	1	3	4			
48 lineal fall pipe, including specials	0	5	1	0	0			
5 cwt. sheet lead at. including laying	20	0	5	0	0			
Plasterer.								
70 square yards Rendering in cement to panels of half timbering	1	6	4	15	0			
280 square yards Lath and plaster to framings and ceilings	1	6	21	0	0			
222 square yards Plastering	1	0	11	2	0			
						36	17	0
Painter.								
Painting all wood and iron work and twice oiling half timbering						6	0	0
						£299	17	0

If instead of half-timbering, the outer walls of bedroom were framed with 4-inch deal, and covered outside with laths and cement rough cast—

Deduct: Sawing, etc	—	£5	0	0		
Labour in framing, etc	—	9	0	0		
Brick on edge filling	—	8	15	0		
Rendering in cement	—	4	15	0		
					27	10 0
Leaving	—				£272	7 0
Add: 60 cubic feet Timber	1 8	5	0	0		
8 squares, Labour, etc	10 0	4	0	0		
82 yards filling cavity, lathing and rough casting	2 6	10	5	0		
					19	5 0
					£291	12 0
If the walls were carried up to the roof in brickwork from	—	£272	7	0		
Deduct 140 yards Lathing	0 6	3	10	0		
		268	17	0		
And add 80 yards 9-inch Work	5 0	20	0	0		
Making cost					£288	17 0
And if the portion above floor joists were rough cast Add to		£288	17	0		
80 yards Rough cast	1 6	6	0	0		
					£294	17 0

It is explained that the work is accomplished at this cost by careful buying of material in the best market and of suitable sizes, and by letting the work by measurement at reasonable prices.

The dimensions of rooms are as follows:—Kitchen, 14′ × 10′; parlour, 12′ × 10′; scullery, 9′ × 7′; larder, 9′ × 3′; bedrooms, 10′ × 11′, 10′ × 10′ and 9′ × 10′.

BOOK REVIEW.

THE SANITATION OF A COUNTRY HOUSE BY DR. HARVEY D. BASHORE. PUBLISHED BY JOHN WILEY & SONS, NEW YORK. (PRICE $1.00.) The aim of this work, as stated in the preface, is to make the country as healthy as the city. It is true that summer resorts sometimes bring sickness instead of health; that there are rural localities which have more typhoid fever per population than our great cities; and Dr. Bashore declares that it is from the country that the cities get twenty five per cent. of their typhoid cases. His contribution to the prevention of this state of affairs is addressed to those persons who build in the country, for permanent residence, and to summer visitors and campers. To the latter he gives warning chiefly about water supply and disposal of wastes. "The price of pure water, wherever you go, is everlasting and unremitting vigilance," and his advice for open water supply, by streams, is "to see the other end to its 'uttermost parts'." For the use of springs, and wells the same consideration must be applied to the geographical strata through which the water comes, but he gives no rules to make this easy. If it is necessary to take water from a suspicious stream, he recommends the plan practiced by the natives of India, who dig little holes in the sand of the shore until they get below the water level, and so, when the holes fill with water get water which has filtered through the sand and is safer than the raw water of the stream.

The matter of waste disposal at summer camps is a matter which is within command, and Dr. Bashore's directions are good and easily followed.

For permanent building in the country there are matters to be considered of which we have little cause to think in town and, it is to be feared, think little in the country. "Ground-water," "ground-moisture," and "ground-air," are all to be considered in building the cellar. If ground-moisture is bad in absorptive soils, permeable soils, which offer less of this danger, must make good going for ground-air which is no less unwholesome. This which is the product of decomposition and putrefaction processes, continually going on in the soil, has an undue proportion of carbonic acid gas, ammonia, hydrogen, ammonium sulphide and marsh gas. Wind, rain and frost all compress it, and, if a cellar is not properly protected, it constitutes an area of diminished pressure into which the ground air passes and thence into the house above. So the precautions necessary in building a country house begin at the beginning.

The book is not long and its matter will not be new to persons having a good knowledge of sanitation, but the points to be considered are brought together in a manner that has the merit of being very readable.

SAND-LIME BRICK.

The use of Sand-Lime brick is not precisely a new idea. Brick made by a similar process have been made in Germany for some time and are said to have been used for government buildings; which (in Germany) is a mark of excellence. The strength and durability of lime mortar are already known to be equal to that of brick. The old brick buildings in Spain have 2 inch bricks and inch joints so that they are one-third built of sand and lime. The writer has stood upon the springing of a Roman barrel vault of stone which, though the crown has fallen long ago, still holds up, and overhangs the perpendicular by means of the tenacity of its mortar.

Mr. [illegible] C. Dean, Secretary of an Association formed in the interest of the Sand-Lime brick industry, gives this account of the process of manufacture.

"The process of manufacturing Sand-Lime Bricks is very interesting and illustrates the value of science in shortening Nature's methods. Chemically these bricks resemble Indian Sandstone, but they are free from the flaws and fissures which make stone perishable when sudden contraction and expansion take place through [illegible] pure sand silicate and high calcium lime, which acts as the bond. These ingredients are thoroughly mixed until every particle of sand is coated with lime, and as the sand is graded in size, the interstices are filled when the mixture is put under a heavy pressure in the moulds. The bricks are piled on cars and run into a hardening cylinder where the pressure is 150 pounds from ten to [illegible] hours. As soon as the bricks are cool they possess a clear metallic ring and are ready to be laid at once in the wall. The entire process does not require more than 24 hours. These bricks, like some quarried stone, grow harder in time as they remain exposed to the air, for the chemical union of the ingredients continues its process for some time."

The best Sand-Lime bricks are low in porosity and there has already been a fire in a large furniture warehouse built with them which left the walls standing with the same appearance (in a photographic illustration) as if they had been built of clay brick.

The brick find favour with the contractors because they are uniform in size, as they are all pressed in moulds and are not expanded, contracted or warped in the process of manufacture. The eveness of size makes building and bonding the easier.

They are said, by the writer quoted above, to "possess unlimited possibilities, from an architectural standpoint, because they can be made of any colour and shade". We may wait for more certain demonstration of this. The permanent building colours that we know of, in brick and terra-cotta, are the result of colouring matter in chemical combination with the material before the application of heat. A mechanical mixture has not the same certainty of result. In the application of colouring matter to the formation of concrete promise has so far resulted in nothing. In the meantime the natural colour of the Sand-Lime brick is said to nearly approach that of Indiana limestone, and that sounds like good architectural colour. For stonework the lightest coloured stone is best as it gives full value to planes and to details. Brick is rather a question of mass, bnt the shadows still have value, and a light colour is associated in our minds with dignified architecture.

What the special liability to imperfection is in Sand-Lime brick has not yet been made public, but there must be chances of irregularity in an artificial product of sand and lime against which it is necessary to guard. Prof. Ira H. Woolson, of Columbia University, has been making experiments on behalf of the Bureau of Buildings of New York, which cover not only this material but various artificial stone products and concrete bricks, and has arranged his results in the form of a specification of tests which (as it comes to us in an exchange) we have printed below. The disadvantage of the artificial building materials is the necessity of tests of a rather elaborate nature but there is no other way to certainty.

RULES FOR THE TESTING OF NEW MATERIALS IN CONSTRUCTION.

The Bureau of Buildings of the Borough of Manhattan, have gone into an investigation as to what specifications should govern in the acceptance of the newer building materials. This was made necessary by the introduction of such new materials as sand brick, cement brick and hollow concrete blocks. Common building brick having been accepted as having sufficient strength, they were taken as [illegible] on which to fix the specifications and the Bureau proceeded to find what strength was indicated by the common building brick. Therefore the series of tests were carried out by Professor Ira H. Woolson, Adjunct Professor of Mechanical Engineering at Columbia University, New York City, with a view to determining such factors as were necessary to the selection of proper specifications. The method of operation and details of the test were recently published in Engineering News.

Prof. Woolson finds as a result of these tests that figures for transverse strength [illegible] in engineering books, show results from 20 to 50 per cent. too high. There also seems to be no conformity between [illegible] and crushing strength, or between strength and absorption. The crushing strength of common brick, as represented by the product of the Hudson River Valley, is close to 4,000 pounds per [illegible] inch. When crushed wet, this figure is always lower from 10 to 45 per cent. For absorption tests, Prof. Woolson recommends only partial immersion. He also recommends that the methods of testing bricks should be standardized, so that results will be comparable.

As a result of the above tests, the following regulations have been formulated by R. P. Miller, chief engineer of the Bureau of Buildings, and approved by Isaac A. Hooper, superintendent of buildings, Borough of Manhattan, New York City:

(1) The regulations are to apply to all such new materials as are used in building construction, in the same manner and for the same purposes as natural stones, brick and concrete are now authorized by the building code.

(2) Before any such material is used in buildings, an application for its use and for a test of the same must be filed with the superintendent of buildings. A description of the material and a brief outline of its manufacture must be embodied in the application.

(3) The material must be subjected to the followed tests: Transverse, compression, absorption, freezing and fire. Additional tests may be called for when, in the judgment of the superintendent, the same may be necessary. All such tests must be made at some laboratory of recognized standing, under the supervision of the engineer of the Bureau of Buildings. The tests will be made at the expense of the applicant.

(4) The results of the tests, whether satisfactory or not, must

be placed on file in the Bureau of buildings. They shall be open to public inspection, but need not necessarily be published.

(5) For the purpose of the tests, at least 15 samples or test pieces must be provided. Such samples must represent the ordinary commercial product. They may be selected from stock by the superintendent of buildings, or his representative, or may be made in his presence at his discretion. The samples must be approximately 8 inches long, 4 inches wide and 2 inches thick. In cases where the material is made and used in special shapes or forms, full size samples may also be called for and tested in such manner as may be directed by the superintendent of buildings to determine the physical characteristic specified in Regulation 3.

(6) The samples may be tested as soon as desired by the applicant, but in no case later than sixty days after manufacture.

(7) The weight per cubic foot and specific gravity of the material must be determined.

(8) These tests shall be made in series of at least five, except that in the fire tests a series of two (four samples) is sufficient. The transverse test shall be made first on full-size samples (8x4x2 inches). The resulting half samples are then used for the compression and absorption tests; but in no case must both halves of the same piece be used in any series. Half samples may also be used for the freezing and fire tests under the same restrictions. The remaining samples are kept in reserve, in case unusual flaws or exceptional or abnormal conditions make it necessary to discard certain tests. All the samples must be marked for indentification and comparison.

(9) The traverse test shall be made as follows: The sample shall be placed flatwise on two rounded knife-edge bearings set parallel 7 inches apart. A load is then applied on top, midway between supports, and transmitted through a similar rounded edge, until the sample is ruptured. The modulus of rupture shall then be determined by multiplying the breaking load in pounds by twenty-one (three times the distance between supports in inches), and dividing the result by twice the product of the width (approximately four) in inches, by the square of the depth (approximately two) in inches.

(10) The compression test shall be made as follows: The sample must first be thoroughly dried to a constant weight. [illegible] of paris or blotting paper, to secure a uniform bearing in the testing machine, and crushed. The total breaking lead is then divided by the area in compression, in square inches.

(11) The absorption test must be made as follows: The sample is first thoroughly dried to a constant weight. The weight must be carefully recorded. It is then placed in a pan or tray of water, immersing it to a depth of not more than ¼ inch. It is again carefully weighed at the following periods: 10 minutes, 4 hours, and 48 hours, respectively, from the time of immersion, being placed in the water in each case as soon as the weight is taken. Its compressive strength, while still wet, is then determined at the end of the 48 hours period, in the manner specified in Regulation [illegible].

(12) The freezing test is made as follows: The sample is immersed as described in Regulation 11, for at least four hours, and then weighed. It is then placed in a freezing mixture or a refrigerator, or otherwise subjected to a temperature of less than 15 degrees Fahrenheit for at least 12 hours. It is then removed and placed in water, where it must remain for at least one hour, the temperature of which is at least 150 degrees Fahrenheit. This operation is repeated twenty times, after which the sample is again weighed while still wet from last thawing. Its crushing strength should then be determined, as called for in Regulation 10.

(13) The fire test must be made as follows: Two samples are placed in a cold gas furnace, in which the temperature is gradually raised to 1,700 degrees Fahrenheit in on hour. One of the samples is then plunged in cold water (about 50 or 60 degrees Fahrenheit), and results noted. The second sample is permitted to cool gradually in air and the result noted.

(14) The following requirements must be met to secure an acceptance of the materials: The modulus of rupture must average 450, and must not fall below 350 in any case. The ultimate compressive strength must average 3,000 pounds per square inch, and must not fall below 2,500 in any case. The percentage of absorption being the weight of water absorbed divided by the weight of the dry sample, must not average higher than 15 per cent. and must not exceed 20 per cent. in any case. The reduction of compressive strength must not be more than 33 1-3 per cent., except when the lower figure is still above 3,000 pounds per square inch, the loss in strength may be neglected. The freezing and thawing process must not cause a loss in weight greater than 10 per cent., nor a loss in strength of more than 33 1-3 per cent., except that when the lower figure is still above 3,000 pounds per square inch, the loss in strength may be neglected. The fire test must not cause the material to disintegrate. (Note—No great stress will be laid in this last test.)

(15) The approval of any material is given only under the following conditions:

(a) A brand mark for identification must be impressed on, otherwise attached to, the material.

(b) A plant for the production of the material must be in full operation when the official tests are made.

(c) The name of the firm or corporation, and the responsible officers, must be placed on file with the superintendent of buildings, and changes in same promptly reported.

(d) The tests must be repeated at any time when called for, on samples selected from the open market, when there is any doubt whether the product is up to the standard of these regulations.

(e) In case the results of tests made under this condition (d) should show that the standard of these regulations is not maintained, the approval of this bureau will be at once suspended or revoked.—*The Improvement Bulletin.*

SPECIFICATIONS OF FIRE-ESCAPES.

The following specification, prepared by a special committee authorized by a meeting of Architects and Fire-Escape Manufacturers held some months ago, has been sent to us from the office of the Inspector of Factories for Ontario. A note accompanying the specification states that the provisions here laid down are prepared for discussion at a meeting to be held at an early date:

BALCONIES.—Balconies must not be less than the full width of opening or openings leading to them, and are in no case to contain less than twelve square feet of floor space or be less than 2 [illegible]. There must be a clear floor space of at least twenty inches between the top of each flight of stairs and the railing opposite and a clear floor space of at least 27 inches between the lowest tread of each flight of stairs and the railing opposite. Balconies requiring a passage at side of stairways or well holes must have a clear passageway of at least 20 inches.

Balconies shall have railings at least 2' 10" high on all sides excepting where stairs lead on end and at open ends or bottom [illegible]. Railings to have handrail and corner posts constructed of 1½" x 1½" x [illegible] iron standards between, not more than 2' 0" apart, rivets to top and bottom rails. The space between standards to have 1¼" x 1¼" iron bars placed crosswise and separately riveted to top and bottom rails.

STAIRS.—All balconies are to be connected by stairways. The strings of these stairs shall be constructed of at least 4" channel iron, 5¼" lbs. per foot, and have steps of at least 6" tread and not more than 10" rise, rivetted to strings with at least two ⅜" rivets at each end. Treads may be had of stamped or perforated steel 3/16" thick, having a 1¼" flange on all sides, or the treads may be constructed of a frame work of 1¼" x 1¼" x ¼" angle iron with one or more 1½" x 3/16" flat bars placed lengthwise in centre, the bars so spaced that there shall not be more than 1" open space between bars or between bars and angle iron.

All stairs shall be provided with an outer railing 2' 6" high, measured perpendicularly from nosing of steps, and all stairs not placed close to wall must have an inner railing of similar construction. These railings shall have handrails of 1½" x 1½" x 3/16" angle iron, supported by 1¼" x 1¼" x 3/16" angle iron standards not more than 5' 0" apart, placed at right angles to strings, and railing to have an intermediate 1¼" x ¼" flat bar halfway between handrail and string. All to be securely fastened together. There must be a clear head room for all stairways of at least 6' 9".

BRACKETS.—Balconies to be supported by steel brackets spaced not more than 4' 0" apart, except where space is required to get head room for stairs, or in other cases where special permission has been given by the Inspector in writing. These brackets to be formed of angle steel of the sizes given in the following table built up with horizontal top chord, angle brace and perpendicular stay all strongly rivetted together with plates of the same thickness as angles in all cases. Each joint to have boiler rivets of the sizes specified in the table, to be hot driven. Top chord of bracket to be tied to wall by round iron bolt running through wall, of size specified in table and rivetted to angle with three boiler rivets of sizes specified, hot driven. Inside end of bolt to be provided with standard nuts and plate washer, this washer to have a bearing on wall of at least 48 square inches.

Angle braces of brackets to be at an angle with the wall of not less than 45 degrees or more than 60 degrees. The lower end of these braces to be split and turned into wall at least 3". Balcony floor to be supported between brackets by three angle irons, one at wall, one in centre, and one at outer edge. These angles to be same size as these specified for brackets.

Area supported by brackets.	Top chord braces and uprights.	Rivets.	Top chord wall tie.
6 sq. ft.	2 in. x 2 in. x ¼ in.	½ in.	1 in.
8 sq. ft.	2¼ in. x 2¼ in. x ¼ in.	½ in.	1⅛ in.
10 sq. ft.	2½ in. x 2½ in. x ¼ in.	⅝ in.	1⅛ in.
12 sq. ft.	2½ in. x 2½ in. x 5/16 in.	⅝ in.	1¼ in.
16 sq. ft.	3 in. x 3 in. x ¼ in.	⅝ in.	1¼ in.
20 sq. ft.	3 in. x 3 in. x ⅜ in.	¾ in.	1¼ in.
30 sq. ft.	3½ in. x 3½ in. x ⅜ in.	¾ in.	1½ in.

CURING CONCRETE BLOCKS.

By H. H. RICE, Denver, Colo.

The essential difference between the use of concrete blocks and monolithic construction lies in the opportunity afforded by the former of thoroughly curing the blocks before they are placed in the wall. Properly cured blocks are, at time of laying, as truly stone as though the formation had been effected by nature's process rather than by the art of man. In many cases, however, inadequate knowledge of the science of curing and failure to employ the practical precautions requisite to insure the best results render blocks totally unfit for use. It is more largely due to such ignorance and negligence than to any other cause that many persons have become prejudiced against the use of this eminently fit building material.

The great characteristic of cement is its hydraulic activity and resultant crystallization. The value of a cementitious agent depends solely upon the thoroughness and uniformity of crystallization. The silicates cannot attain that full crystallization necessary for maximum strength and greatest durability without the maintenance for a considerable period of time of conditions both favorable and uniform.

The initial and final sets are but expressions denoting the [illegible]. The former denotes the attainment of a degree of [illegible] to which it [illegible] against a slight jar; the latter denotes the attainment of rigidity against [illegible]. Now, however are the conditions producing the chemical action manifested in the intial set, they must be substantially maintained to secure the most efficient final set.

It is, however, evident that the requirements of such maintenance will vary according to the mixture used and the condition of the block when taken from the mold. In a medium mixture (a mixture from which tamping or pressure will cause water to slightly flush) there is somewhat more moisture than necessary for the initial set, and subsequent sprinkling from seven to ten days will suffice. In the dry mixture there is barely enough water for the initial set, and copious sprinkling should begin as early as may be possible without damage to appearance and continue for twenty or thirty days.

Time is of the essence of scientific curing. The exigencies of modern business tempt the block maker, almost beyond power of resistance, to shorten the time of curing and thus sacrifice quality for speed of construction. To this end curing by steam has been the subject of some experiments, the results of which demonstrate that steam accelerates partial crystallization, but the tests thus far made have failed to prove that the full strength of the cement is utilized, and until that be accomplished steam curing can scarcely be recommended. To rush partially cured blocks into a wall is an error so grave that the saving in time is no just compensation for the evil results which will surely ensue as the direct result of the absence of conditions requisite to a thorough scientific cure.

In stacking blocks in the curing yard let all faces be turned one way, and discoloration avoided by not allowing any part of one block to rest in contact with the face of another. Do not pile blocks one upon another, but avoid contact and permit free circulation of air by using pieces of lath between tiers.

In sprinkling use a fine spray and let it play on the back, as the impact of water will ruin a freshly made face. Let sprinkling be thorough and at such intervals that no portion of a block will dry out. Remember, always, that drying is not curing.

The failure to maintain a uniform condition of moisture during curing causes variation in contraction, and is responsible for most of the cracks developed. Uniformity of temperature should not be disregarded and may usually be sufficiently maintained by thorough sprinkling, provided that blocks are properly sheltered from the direct rays of the sun. To expose blocks without such shelter while curing is fatal, and will result in ultimate disintergration and crumbling.

To avoid expansion cracks, blocks should not be frozen during the first few days of their existence. The curing of blocks in winter is, however, by no means impracticable, although requiring more time, as crystallization is slower and is almost entirely suspended when the temperature is a few degrees below freezing. It is, however, merely a suspension and is resumed upon a rise in temperature.

Climatic conditions must also be considered. A dry atmosphere or intense extremes of heat and cold will require greater care than a humid atmosphere or a comparatively even temperature.

The influence of care or carelessness in curing on uniformity or diversity of color is seldom appreciated. This is a point worthy of careful study and exhaustive experimentation, for the day is at hand when the man [illegible] as to [illegible] his product may not hope to meet the demand for the artistic in concrete block construction.

Strength is the great essential—the final test by which every building material must stand or fall—and in this regard scientific curing is of prime importance. Cement is the bonding element, attaining its ultimate strength only by thorough crystalization, and thorough [illegible] is only secured [illegible]

I have been asked by men, otherwise intelligent, how long it took blocks to dry out. I have seen blocks otherwise good, exposed to the intense heat of a summer sun and given little or no attention. Is it that such practice should produce blocks porous, unsightly and weak? Is it fair to the people who desire to avail themselves of the advantages of this construction, and rely upon the knowledge and integrity of the manufacturer? Let us apply scientific methods to our work if we desire permanent and enduring success.

The Architectural Association of London publish a humourous journal called "The Tufton St. Tatler or the Purple Patch" from which the following is an extract.

THE DAY'S WORK.

I got to the office at half-past ten,
And sat on my stool and sighed;
Poor Jim grew sleek on a pound a week
In this way till he died.

I drew a moulding about a door,
And figured it two by three;
Then feeling weak, I went to seek
A neighbouring A. B. C.*

When I came back in the afternoon
That moulding looked too small;
After earnest thought, I felt I ought
To rub out door and all.

Just as I finished, the clock struck five,
And I thought, with a weary sigh,
"It's hard for you to earn your screw
In this way till you die."

*Aerated Bread Company restaurant.

INTERCOMMUNICATION.

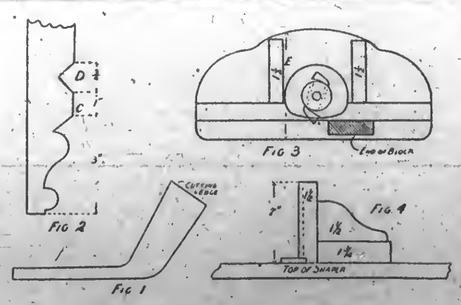
[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "A Country House Owner": I wish to place a waterproof roof of cement over a flat roof and make a terrace some 20x30 feet, and would like to know how this can be done in such a manner that the whole will be waterproof?

ANS.—There is really no difficulty in making just such a roof as you desire. The joists or rather timbers employed must be heavy enough to sustain both concrete and such weight as may be placed on them. The joists should have strong cleats or strips well spiked to their sides about four or five inches below the top edges. Cut in between the joists, one inch boards to form a bed for the concrete. Then fill in between the joists with concrete well tramped down. There should be at least two inches of concrete and cement above the edges of the joists in order to make a good strong job of the work. It is a good idea to cut the top edges of the joists bevel from both sides, giving them a feather edge on top, similar to the top of the letter A; there will, then, be but little wood on top of the joists to disturb the concrete. The top of this work must be finished off with neat cement, and marked off as pavement or flags. There must, of course, be a small pitch to this roof in order to carry off all water from snow and rain. A roof of this kind, when properly done, will be efficient, lasting and not unsightly; it will also be expensive, but in the end, economical.

From "A Woodworker", Will you kindly inform me as to the best way to form moulding blocks and other similar work on a shaper?

ANS.:—Base or head blocks of almost any shape may be formed on a shaper by using a bent cutter, which is placed between the collars of a shaper in the ordinary way, but bent forward at the end, which gives the shape of cutting edge of knife and also the edge of block when finished. Fig. 3 shows plan of



TO MAKE MOULDING BLOCK ON SHAPER.

with handscrews. This form should be about 7 inches high and cut out on the back as shown in Fig. 3, so as to leave about 5/16 inch of wood for the knife to cut through so as to form a bridge to carry the block past the knife.

In making the knives, it is best to have two (in order to balance well,) letting one cut from A to B and one from B to C. Then put on another set of collars, with a small V shape, to cut at D; this also must have a balance. Fig. 4 shows a cross-section at E. The ½ inch piece on bottom of form gives clearance for the knife above shaper table.

From "Contractor," I should very much like to learn through your columns whether there is any advantage—other than that of economy—In making use of small timbers to build up larger timbers of a given size?

ANS.:—This question has been discussed *pro* and *con* many, many times, but so far as we know, has never yet been definitely determined. With heavy timbers in positions, where absolute strength is the main object, the architect or engineer simply gives the dimensions, and leaves it to the option of the builder, whether he put in a single timber of one piece, or a number of pieces the aggregate of which would be as large as the single timber, the great question being whether four pieces 1 foot square will bear a greater or lesser weight than one solid stick 2 feet square each being of the same variety of wood and alike in all ther respects. Before a question of this kind can be answered in a manner to suit all contingencies it becomes very important that the nature of the strain be fully understood. If the slight movement of the ends incident to the bowed condition be admissible, it is reasonable to suppose that the four pieces would bend more without breaking, inasmuch as, the moment a piece of timber is subjected to any influence causing it to assume any shape than the original, the molecular construction and cellular combination is disturbed. Hence, if we bend forcibly the timber 2 feet square a fraction out of line, at the lower side the grains are made to expand, at the upper side become shorter, and, as it is out of the question to contract vegetable matter without disturbance of some kind, this shortening of the upper portion is accomplished either by forcibly tearing one layer from another and allowing [illegible] to accommodate the inequalities, or else the entire upper half will be composed of a series of wrinkles and the tensile [illegible] of [illegible] practically and effectually destroyed. At the centre of the timber, the pressure being counterbalanced from above and below, the particles will be found inert; thus we have with the solid timber three forces of an unequal character, all acting in unison to restore an equilibrium, which, when accomplished breaks the timber. If we measure the ends of the solid timber while the pressure is in full force, we will find them very uneven, or in the form of steps approaching the centre from below and receding from the centre above, and to do this it is but reasonable to conclude that these grains of wood must have slid past each other, of course materially affecting the power of resistance to pressure the timber ordinarily possessed. With the four timbers, each 1 foot in section this difficulty is overcome in exact proportion, as we have brought mechanical means to bear and separated these tissues in an artifical manner. Now, if we apply the same pressure, though the four timbers may bend further than the solid stick with the same pressure, at the same time it has not lost its power of restoration and will stand repeated pressure much longer and by

examination we will find the same inequalities apparent at the ends, but more unevenly divided, the greatest disparity being at the points of contact with the different sticks. Again, timber sawn in two and the sides reversed will bear a greater pressure and resist it longer than the solid pieces for the simple reason that when these inequalities of pressure are brought to bear we present a side for expansion containing a greater degree of elasticity, and the portions to contract, or that side within the arc when bent, being nearer the centre of the tree, are more compact and solid; hence the wrinkling tendency is overcome in a measure. This reasoning applies to all kinds of built-up timber, whether for joists, posts, girders or bearing beams of any kind.

From "Builder," Please publish a design for a porch entrance which is built of brick having square brick columns and elliptical brick arch, and ornamental gable and oblige?

ANS.:—It is rather difficult to publish a design for this purpose as we do not know the style of building

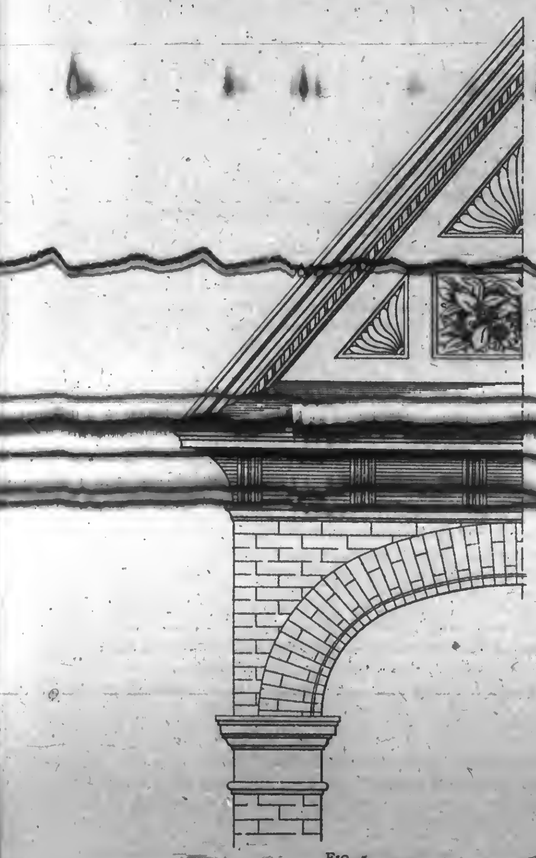


FIG. 5.

to which the porch is to be attached, however we submit the following Fig. 5, which may perhaps suit the requirements.

From "Plasterer," Please inform me regarding the best methods to adopt and the materials to employ in putting up plaster work on canvas, to imitate old buildings.

ANS.:—The face work of temporary buildings for exhibitions, etc., when not composed simply of canvas and painted, is usually executed in fibrous plaster, commonly called, in the trade, stick and rag or staff. For a stone-fronted building the ashlar work would be formed with cast slabs nailed to pine studs about 2 ft. to 2 ft.6 in. apart. The moulded work would be cast at the manufacturer's works, and fixed on the site. Several firms in Toronto execute this kind of work.

From "Student," Kindly publish in your valuable paper the following ornaments "Eggs and Dart," "Leaf and Dart," "Leaf and Tongue," "Bead and Eillet," and oblige.

ANS.:—The designs shown at Figs. 6, 7, 8, 9 and 10

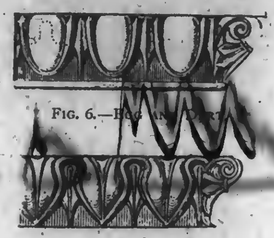


FIG. 6.—[illegible]

FIG. 7.—LEAF AND DART.

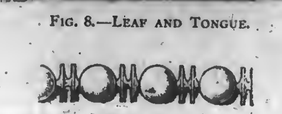


FIG. 8.—LEAF AND TONGUE.

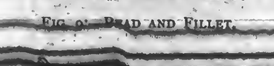


FIG. 9.—BEAD AND FILLET.

FIG. 10.—BEAD AND FILLET.

are representations of the moulding named, Figs. 9 and 10 show the bead and fillet in two styles round and elliptical.

From "Contractor," Please describe the correct method of connecting house or branch drains to (1) pipe sewers, and (2) to brick sewers. What is the practice in Toronto or Montreal, when there is no branch in the sewer? Should a hole be cut in the sewer and the end of the drain pipe inserted?

ANS.:—All connections of house drains to sewers are usually made by the local sanitary authority, or by the builder's men under the supervision of the sanitary authority. In order to connect to an old pipe sewer, a length of the pipe should be taken out and a Y branch inserted. In the case of a large pipe sewer through which water is constantly flowing, so that a length of pipe cannot be removed, a hole is cut into the pipe and a saddle junction piece cemented to the hole. In either case the junction should "look up" as much as possible

in order to prevent eddies or back flows up the branch drains. In the case of a brick sewer, a hole is cut through the wall, the pipe end inserted, and the hole made good round the pipe. In some cases proper stoneware junction blocks are built in the sewer walls and then connection is easy. In the cities named, all street connections are under the control of officials appointed for that purpose and whose duty it is to give such directions as may have been decided upon by the sanitary department.

From "Bricklayer," Is it possible for a wall in front of a tennis court, to be built in herring-bone bond?

ANS.:—Yes, a wall may be built in herring-bond bond, as shown in Fig. 11 though we cannot say that

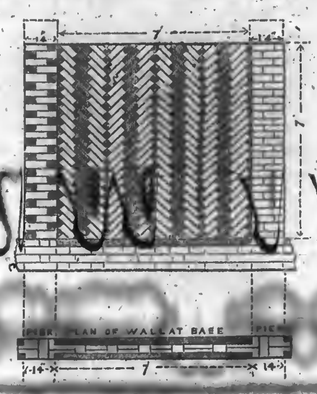


FIG. 11.

we would approve of such a wall. The sketch shows a panel 7 ft. square, with piers 14 in. by 9 in. The bricks for diagonal wall must be gauged and laid in a neat joint of black mortar, the shaded bricks red, the others white, or relieved with red as per sketch. The scale is ½ in. to 1 in. and the bond at base set out to be continued if necessary.

A New Ontario subscriber asks: Could you tell us the best way of making a daily test of the cement used on a job [illegible] what instruments requirable and where [illegible]

ANS.—Cements of different character differ very widely in their rate and manner of setting. Some occupy but a few minutes in the operation, while others require several hours. Some begin setting immediately and take considerable time to complete the set, while others stand for a considerable time with no apparent action and then set very quickly. One way of testing cement with regard to setting is by trying when the mortar will sustain a needle carrying a specified weight within a given time; the difference in time being the measure of the quality of setting. There are so many conditions to be considered when testing cement that a number of appliances are necessary to discover all the qualities, and these appliances are only found in the laboratories of our colleges and universities or in the larger manufactories of cement. Some are expensive, some quite simple. In France and Germany the following qualities are usually tested for, namely: fineness, specific gravity, apparent density, homogeneity, time of setting, tensile, compressive, flexural, and adhesive strength, permanence of volume, porosity, permeability, and yield of mortar. Each of these qualities must be tested for separately, and cements that may excel in one or more of these qualities may fail in other important ones. The art of testing cement requires thorough knowledge of the subject as well as experience, accuracy and skill in manipulation in order to obtain results of value for comparison. Perhaps we could aid you if we knew for what quality you desired the test. We do not know of any testing instruments in the market or where they may be obtained. There is a volume written by Prof. Jameson, of the State University of Iowa, in which a number of testing machines are illustrated and described, and in which much information regarding testing cements is included. The price of the book, we think, is $2.00.

REINFORCED CONCRETE ROUNDHOUSE, TORONTO.

The Grand Trunk Ry. has recently constructed at Toronto, Ont., a reinforced concrete round-house that has attracted considerable attention from railroad officials. It has thirty stalls, each measuring 18 ft. in width at the inner circle, and 26 ft. at the outer circle. Each stall is 92 ft. long, and divided into three sections, and carried on four columns. The entire structure is built of concrete, reinforced with the Kahn trussed bars.

The interior columns are 14 in. square, and contain each four ½ × 1½ in. trussed bars. The diagonals of these steel members are bent horizontal in order to obtain the effect of hooping. Angle guards were placed in all corners in order to prevent chipping. The columns in the outer circle are T-shaped, forming a pilaster on the outside, and at the same time supplying recesses for keying the curtain wall between columns. The joints at these points allow for expansion and contraction.

In designing the columns in the interior circle, it was feared that locomotives striking the outside doors would break the concrete columns which carried the door. For this reason these were made of three channels filled with concrete. This construction was decided upon because such a column would not break, but would merely shift off its foundation if struck with a locomotive. Doors were fastened directly to these channels. On the side not containing a channel were placed ½ × 1½ in. trussed bars as a reinforcement.

Radial lines of reinforced concrete girders were placed between columns at a height [illegible] from the top at the outer circle, and 24 ft. 2 in. at the inner circle. Seven longitudinal rows of reinforced concrete beams were spanned between the girders and columns. Both beams and girders were reinforced with Kahn trussed bars in the bottom, and over the supports they were invariably made continuous with inverted bars. Each beam contains in the bottom at least two bars full length and one bar about two-thirds the length at the bottom in the center and raised at the ends. Between the beams and girders is a 4-in. reinforced concrete slab, made continuous over the entire area.

Especial attention was paid toward obtaining an absolute monolithic character in the entire structure, so that if an excessive load were placed upon any one portion the same would be distributed over the adjoining panels. Anchors for carrying steampipes and controlling individual smokestacks over locomotives were placed in the concrete while the same was green. —*The Engineering Record.*

A THEATRE FOR THE PEOPLE.

MM. Coquelin and Binet propose "a threatre for the people" in Paris without corridors and passages. The auditorium would communicate through a single vast quadrangle with the street.

MONTREAL NOTES.

The advancing season brings to view a pretty heavy crop of dwelling houses in and around Montreal. Naturally the greater part of them are built as speculations either to let or to sell. Taking these as a whole they cannot be said to reflect much credit on the judgement of the producers nor on the appetite of the consumers. That souls should be found so thirsty as to be glad to

FIG. 1—HOUSE IN ARLINGTON AVENUE, WESTMOUNT.

lap up the outpourings of galvanized iron that bespatter so many of these ruinous erections would seem to bespeak them hydroptic with some terrible disease. Probably no material ever used in building has lent itself with such fatal facility to the degradation of the art. The multiplication of foolish shapes which this material is made to assume in the pitiful notion that they tend to beauty, seems to know no end. No form so harsh and ugly, no feature so vain and meaningless, but it is set up upon the housetops as tribute to beauty. Oh Ornament what sins are [illegible] stair hanging about their faces and a bristle of galvanized puerilities along the top offer about as painful a spectacle as anything ever built.

One cause which has played an important part in calling into being this galvanized caricature of architecture is, undoubtedly, the introduction of the flat gravel roof. This form of roof, easy to construct and found convenient in so many ways—for it retains comparatively little snow, being wind-swept, and it forms no icicles around the eaves, being drained to the centre or the back—has the disadvantage of failing in picturesque effect. The pitched roof, even when of low pitch, always suggests the solidity of a building, and, more especially when flanked by gables carrying chimneys, gives variety and picturesqueness to the sky-line. It is really the very hankering after this variety and boldness of effect that induces these outbreaks in galvanized iron. The monotony of the flat roof-line is too grievous to be borne. With this feeling one cannot help but have a great deal of sympathy, however much one must deplore the insobriety to which it leads.

Another circumstance tending to poverty of appearance in the cheaper classes of houses is the method of building in three-inch plank, sheeting with building felt and then veneering the outer face with brick or stone—a method, probably almost peculiar to the French-Canadian, and which produces a house about equal to frame house for endurance and weather resisting quality, with probably a slight advantage in regard to fire resistance. The impossibility of employing stone or brick cornices or other projections of any weight with such a construction is apt to lead to a deadly flatness and monotony appearance. Hence again the very human desire to obtain variety, at any cost, and the use of galvanized cornices and other rubbish, which weighing light is at least a physical possibility. It is true that wood is a kindlier and pleasanter material which might serve the purpose, but the alleged longer endurance of the iron is given as a reason for the preference which it is receiving more and more.

Coming to the internal disposition of these houses—a reprehensible practice becoming much too common is the 'dark-room' or room without a window. The most common form of this is the room at the back of a larger apartment and communicating with it by an 'arch' or six feet wide opening on which a curtain may or may not be hung. One advantage of this arrangement is that the two rooms may be spoken of as merely one large well ventilated room, when dealing with authorities who are likely to find fault with such a disposition, but they immediately become two rooms

FIG. 2—HOUSE ON THE COTE ST. ANTOINE ROAD, WESTMOUNT.

when terms of lease are being discussed with an intending tenant. In a number of quite recent houses, renting at from $15 to $20 per month, rooms are often introduced without either window or communicating archway. Where such dispositions are permitted, sanitary authorities will effect little in the way of limiting the spread of consumption by regulations as

to spitting on the sidewalks, good though such rules may be. The dark w. c. is also a great deal too common. Even with a certain apology for ventilation, a dark room will never be a clean or a sanitary one. Climatic conditions may be pleaded as the cause of the failure in external appearance of these houses, but they have no share in the internal deficiencies.

Of houses of the small villa class Montreal has a remarkably small proportion, but in Westmount and other suburbs a number are to be found. In these the pinch of poverty is naturally not so much in evidence. The evils spoken of above are here also somewhat too prevalent. The illustrations show a few of the pleasanter examples. The house in Arlington Terrace, (Fig. 1), shows a heroic endeavor to deal quite frankly with the problem of the flat roof. In this one and in that in the Cote St. Antoine Road, (Fig. 2), a "common" brick with good variety of colouring has

and terribly good Laprairie pressed [illegible] such a monoply in the district. The house at Outremont, (Fig. 3) is roughcast of yellow color. The woodwork, solid and heavy of scantling, is almost black in tint and the situation on the mountain side is charming. The house at Roslyn Avenue Westmount, (Fig. 4) may be taken as a fair example of the Georgian or Colonial style of villa, more commonly affected in the New England States where this tradition belongs. One can contemplate any of these houses with a feeling

FIG. 4—HOUSES IN ROSLYN AVENUE, WESTMOUNT.

of thankfulness at finding some dwellings where the disease of galvanized iron ornamentation has not settled.

CONCORDIA SALUS.

The Builders' Exchange of Cleveland took their annual summer outing this year to the Muskoka Lakes. Two hundred members of the Exchange took part in the trip and, as they take their ladies with them, the excursion was a cheerful one. On the first evening when they left Cleveland they entertained themselves on the steamer by singing popular songs with the help of song books which were provided, and by listening to numerous stories from the entertaining members of the Exchange. They made the Royal Muskoka Hotel on the following [illegible] Toronto, and in a blaze of music and dancing, followed by a day of excursions to opposite ends of the Lakes and another musical evening before they returned home so as to arrive early on Saturday morning in time to close up the business of the week.

G. T. KNIGHT & SON
Manufacturers of
Building Supplies
we make a specialty of
Doors and Sashes; Mouldings and all kinds of turned goods.
Address, MEAFORD, ONT.

TENDERS WANTED
A Weekly Journal of advance information and public works.
The recognized medium for advertisements for Tenders.
CANADIAN CONTRACT RECORD
TORONTO

METILE
Beautiful
Economical
Sanitary
Is unsurpassed for
KITCHENS, BATHROOMS, Etc.
Perfectly sanitary, will last indefinitely, can be applied to old or new plastered walls (without removing the plaster). Costs Little.
Write Us for Catalogue and Prices.
— DO IT NOW —
THE VOKES HARDWARE CO., LIMITED
111 & 113 Yonge Street — — TORONTO

Canada's Most Expert Radiator Manufacturers

DO YOU KNOW?

The difference between "SOVEREIGN" RADIATORS and others is that they embody new features in construction and design. We are the most thoroughly practical men in the trade and have spent years in study on the subject of Radiation, and have embodied all the latest features and discarded every weak one known to the trade--that's the answer.

"SOVEREIGN" RADIATORS
ARE NEW
Screwed Nipples No Bolts

Merit always wins. Leading Architects protect their reputation against prospective danger and trouble by specifying Only Radiators of Actual Merit. This quality is found only in the Sovereign.

TAYLOR-FORBES COMPANY
TORONTO 21 Richmond St. West
Head Office and Works GUELPH
MONTREAL 9 De Brisoles Street

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.
22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written notes of interest from their respective localities.

Subscribers who desire their address changed should give prompt notice of same, stating in doing so, both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	S. G. CURRY,	,,
2ND VICE-PRESIDENT	W. A. LANGTON,	,,
TREASURER	HENRY SIMPSON,	,,
REGISTRAR	W. R. GREGG, 53 King St.,	Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	,,
J. WILSON GRAY	,,
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD,	Montreal.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE,	Montreal.
2ND VICE-PRESIDENT		Montreal.
SECRETARY	J. H. VANELS,	Montreal.
TREASURER	D. R. BROWN,	Montreal.

COUNCIL:

H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.	T. MARTIN.
GEORGE DUTHIE, 1st Vice-President.	CANNON, Jr.
JOHN MALONEY, 2nd Vice-President.	R. G. KIRBY.
JAS. CRANG, Treasurer.	A. MARSHALL.
	GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.	J. JONES.
GEORGE C. YOUNG, 1st Vice-President.	ED. MARTYN
JAS. S. LUNDY, 2nd Vice-President.	JNO. WHITTAKER.
GEO. S. GOULD, Secretary-Treasurer. 478 English St.	L. H. MARTYN.
	A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M. FRASER
H. A. BELL, Treasurer.	E. O. BAYNE
T. BRADLEY.	D. BAGNT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President.	A. R. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President.	T.D. ROBINSON, Treasurer.
G BURGEAULT, 2nd Vice-President.	ALEXANDER IRWIN, Sergeant-at-Arms.

Directors: T. G. Latimer, R. Cass, P. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Pryne, T. W. Morley, Thos. Cotter, T. A. Girolm.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.	JOHN DUTHIE
EDWARD M. ROBERTS, Vice-President.	JOS. O. DESLAURIERS
PHILLIP LAHEE, Hon. Treasurer.	JOHN GRAY,
J. HERBERT LAUER, Secretary.	GEO. H. HOOD.
JAS. SIMPSON AND J. H. HUTCHISON.	Past Presidents

CHAMBRE SYNDICALE DE LA CONSTRUCTION.

(French Builders' Exchange.)
83 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, Jr., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUS E. Treasurer.	ELZ. COTE.
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN - -	Chairman
E. W. WHITTINGTON - - -	Secretary
THOS. CATTERALL - - - -	Treasurer

PERSONAL.

Mr. A. E. Nicholson of St. Catharines, recently a student of architecture with Messrs Gordon & Helliwell, of Toronto, has opened an office for himself in St. Catharines. Mr. Nicholson had already a building business ready to his hand when he came to Toronto, and, after communication with the Council of the Ontario Association of Architects, decided to article himself as a regular apprentice and prepare for all the examinations of the Association. Having passed all the examinations of the Association Mr. Nicholson is now a registered architect by examination, and, as a person who has fulfilled the ideal of the Ontario Architects Act in taking advantage of its course of training, we hope he will have a distinguished success.

The Don Valley Brick Works

are now manufacturing

POROUS

TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

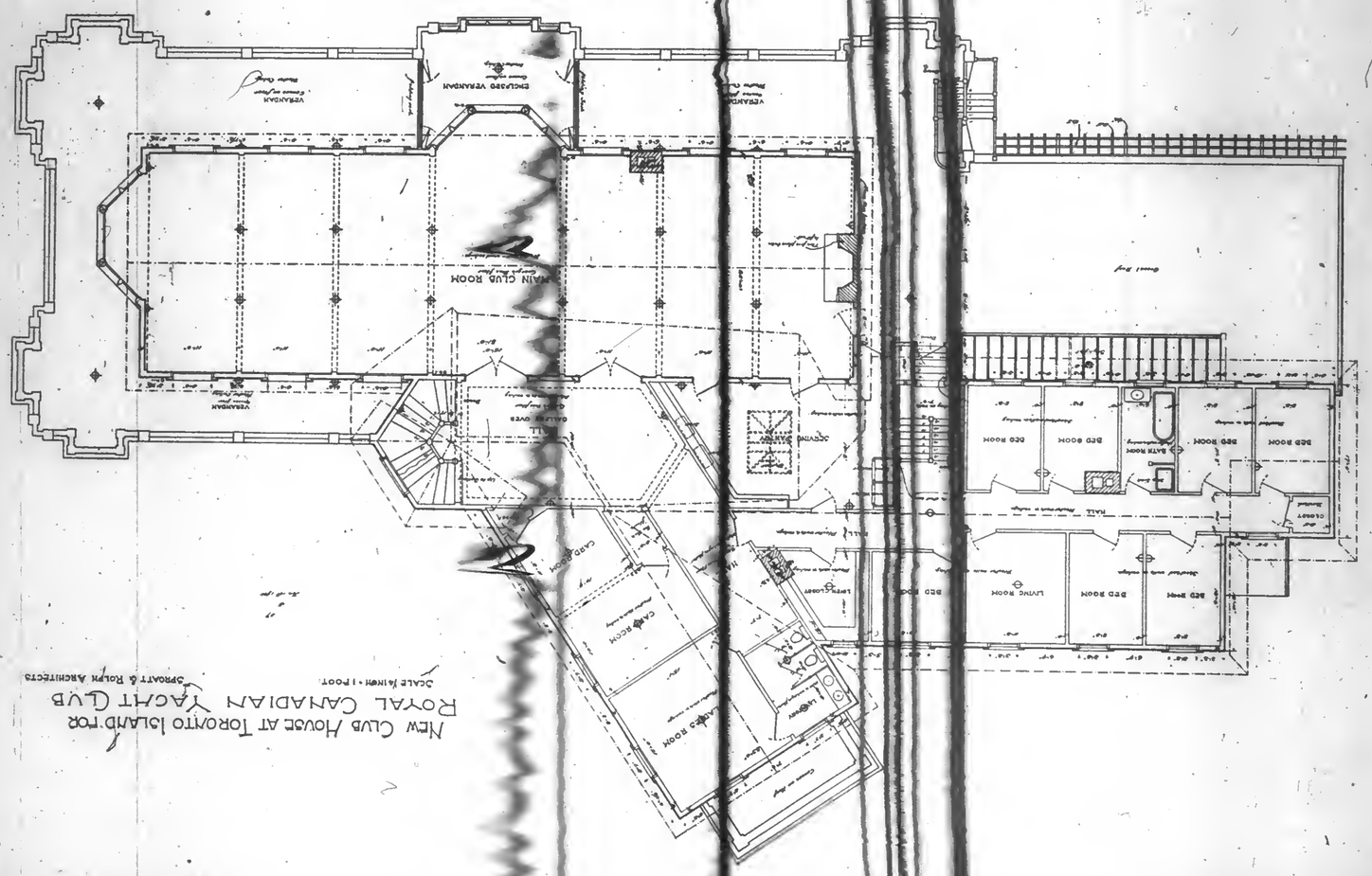
MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER.
SEPTEMBER, 1905

CANADIAN ARCHITECT AND BUILDER.

FIRST FLOOR & ROOF PLAN

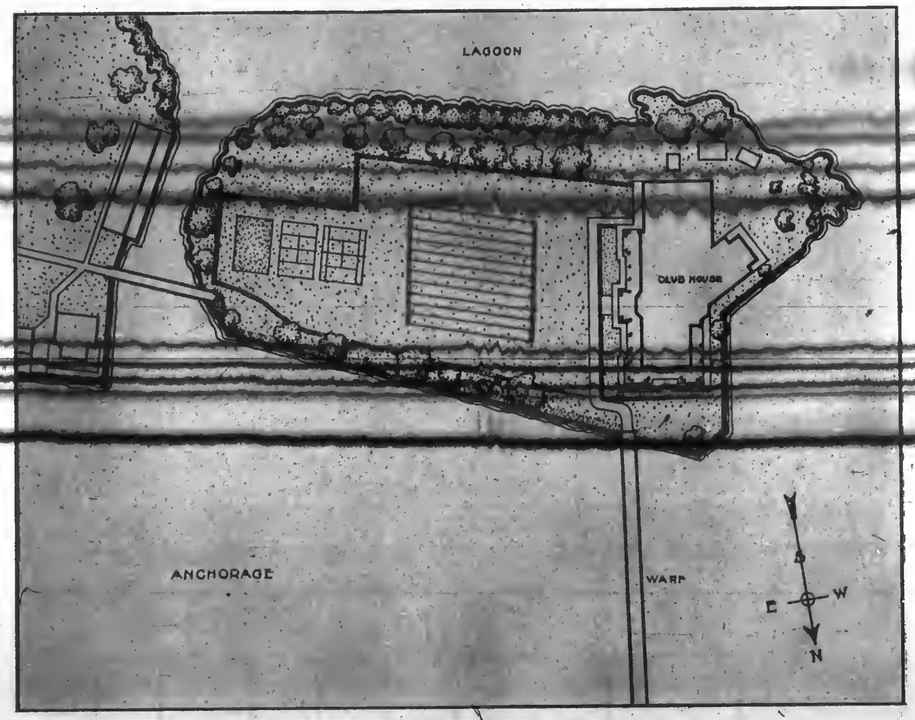


New Club House at Toronto Island for
Royal Canadian Yacht Club

Scale ⅛ inch = 1 foot

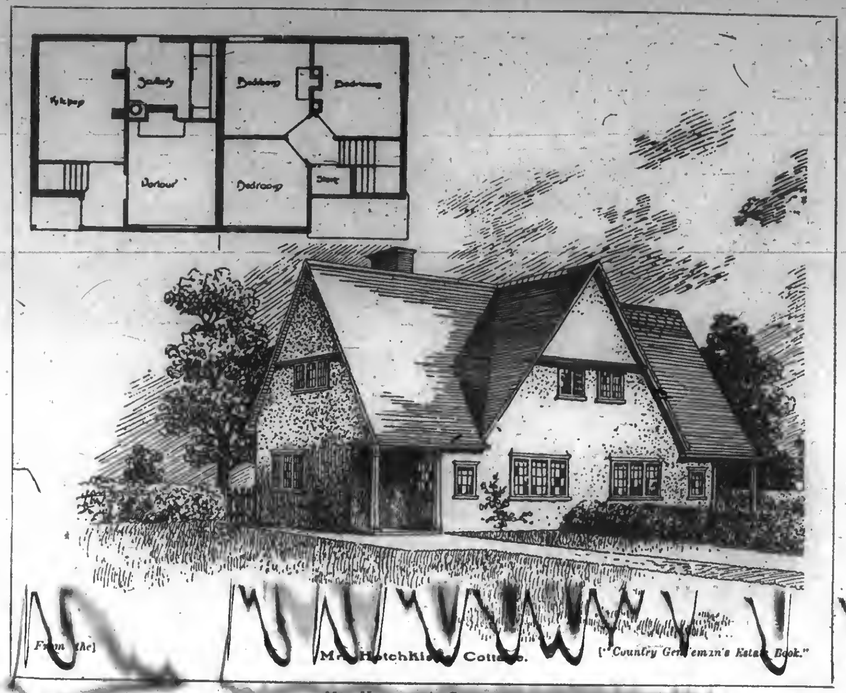
Sproatt & Rolph Architects

VIEW FROM THE SOUTH-EAST.



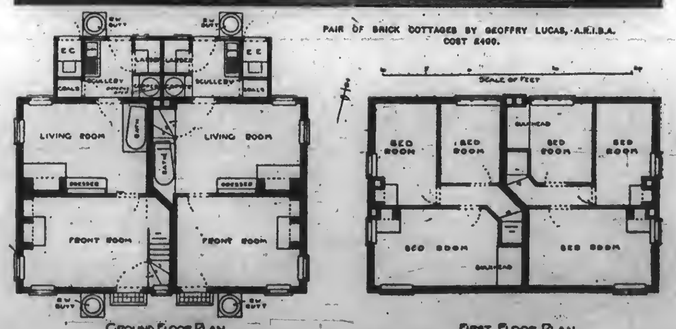
PLAN OF SITE.

NEW CLUB HOUSE ON TORONTO ISLAND FOR THE ROYAL CANADIAN YACHT CLUB.
MESSRS. SPROATT & ROLPH; ARCHITECTS.



MR. HOTHKISS'S COTTAGE.
From the "Country Gentleman's Estate Book."

PAIR OF BRICK COTTAGES BY GEOFFRY LUCAS, A.R.I.B.A.
COST £490.

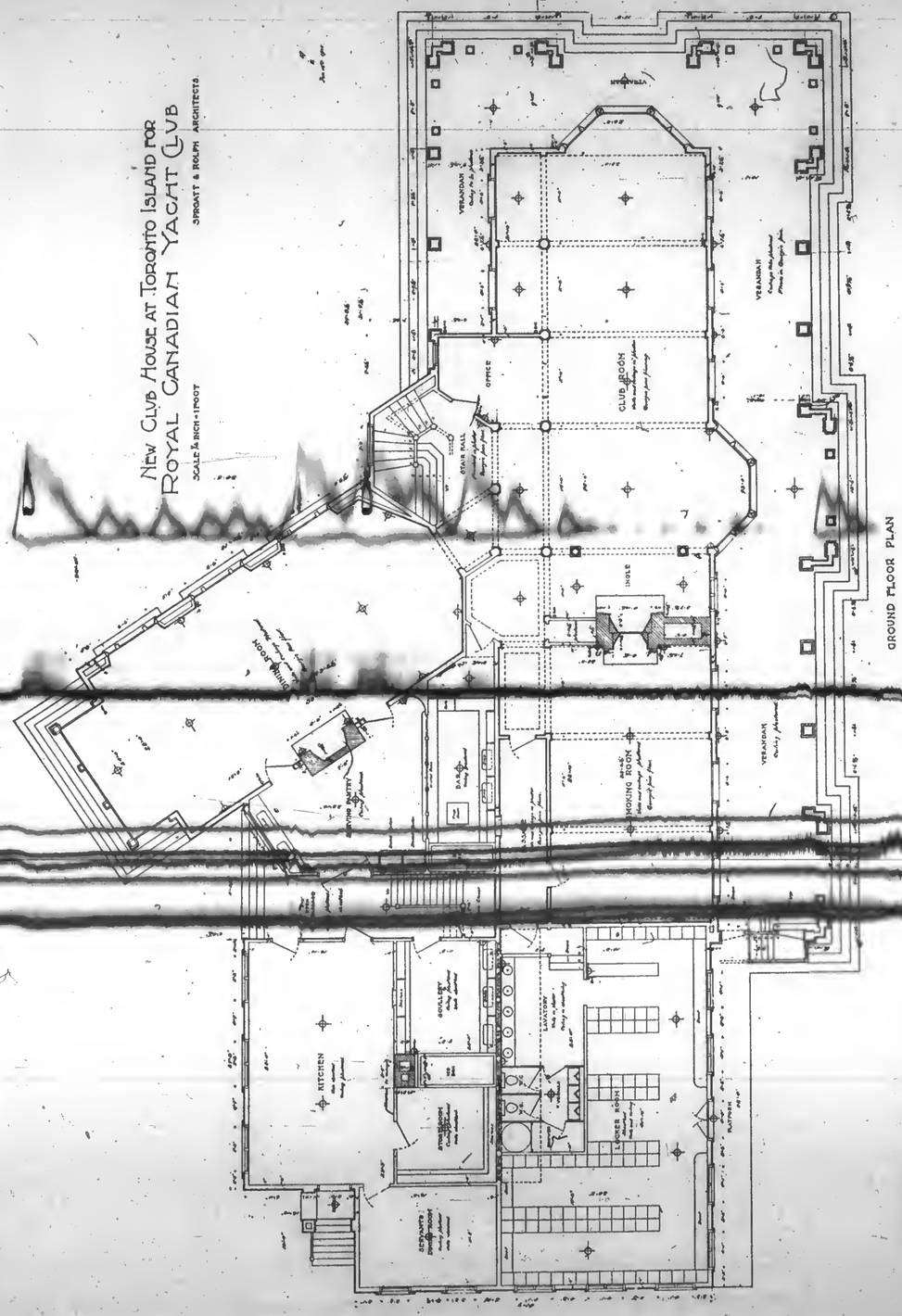


GROUND FLOOR PLAN

FIRST FLOOR PLAN

From the "Builders' Journal and Architectural Record."

CHEAP COTTAGES FROM ENGLISH SOURCES.



NEW CLUB HOUSE AT TORONTO ISLAND FOR ROYAL CANADIAN YACHT CLUB

SPROATT & ROLPH ARCHITECTS

SCALE ¼ INCH = 1 FOOT

GROUND FLOOR PLAN

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
W. A. LANGTON - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 213. SEPTEMBER, 1905.

ILLUSTRATIONS ON SHEETS.

Cheap Cottages at Garden City, Essex, Eng.—Designs by Messrs. Gilbert Fraser, H. Cayley and F. W. Troup.
No. 500 Wilbrod St., Ottawa.—Mr. J. W. H. Watts, R.C.A., Architect.—The Drawing Room, The Library.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Canadian Bank of Commerce, at Edmonton—Messrs. Darling & Pearson, Architects, Toronto.
Main Entrance to the C. P. R. Station at Winnipeg.—Mr. E. Maxwell, Architect, Montreal.

CONTENTS

Editorial	129-130	Book-Keeping from a Master Painter's Standpoint	142
An American Gothic Revival	131-132	Cement Block and Cement Brick Machines	ii.
Our Illustrations	133	Exhibits at the Canadian National Exhibition, Toronto	iv
What I Want in My House	134	Legal	ix
Character in Park Design	135-136	Personal Transportation in Factories	x
Common Defects in Existing Buildings	137	Labor Case ended	xi
Preventing Frost on Show Windows in Winter	137	Indestructible Houses	xii-xiii
Intercommunication	138-139	Building Material from Waste	xiv
Bevel Rule	140	Testing a Reinforced Concrete Factory	xv
Montreal Notes	141		
Books	141		

An Architects Bequest for Architecture.

The late Mr. Cummings, of Boston, the designer of the new Old South Church, has left fifty thousand dollars to the Boston Museum of Fine Arts with the provision that the income shall be used "in the purchase of representations—whether models, casts, paintings, drawings or photographs—of the best architecture of all ages. "There is a second bequest [illegible] Athenæum, whose to use the income of the fund is the purchase of architectural books and photographs. The annual income from each fund bears a suitable relation to the cost of the objects required by each institution, and seems to be sufficient to take advantage of the best opportunities that offer from time to time. The most satisfactory part of the disposition of the bequest, however, is that it leaves opportunity for the future, and does not saddle upon the institutions benefited either a collection or directions for the acquirement of a collection which, however well it would suit our ideas of the necessary thing, may have but faint interest for students of a future generation.

The Albany Disaster and Others.

The coroner and a commissioner of experts, appointed for the purpose, have been investigating the responsibility for the accident in the Meyers department store at Albany, and their reports, which are practically identical, have resulted in the arrest of the contractor and his superintendent, who are both held for manslaughter. The evidence shows that excavation was carried too near the piers that collapsed, and that the shoring of the floors above was insufficient.

This evidently fair finding is just in time to be an example for a [illegible] cases of collapse that have occurred. In New York an old brick house has collapsed in consequence of blasting which was [illegible] on in an adjacent excavation. Nine persons were killed. Shores were being placed against the walls, by a wrecking gang from the Building Department, when the collapse occured. In Pittsburgh, a new wall went down with several men on it, some of whom were "fatally hurt." In Boston—or as the *American Architect*, from whom we get our information, says "even" in Boston—there has occurred the fall of an old building undergoing alterations. It is evident that "an alteration job" should, at any rate from the building inspector's point of view, lose the slight that is usually put upon it as a second-class affair, and should receive first-class attention.

The late Mr. Alfred Waterhouse.

It appears from the biographical notices of the late Mr. Waterhouse that have been appearing sice his death last month, (August 22nd), that his own choice of a profession was painting; the choice

of architecture as a profession being the result of a compromise with his father who (he was a Quaker) esteemed commerce more highly than art. It appears also that the taste for painting did not suffer from the streneous practical life that Mr. Waterhouse lived, as an architect devoted to large affairs; and when at length he was forced to take leisure, it was in painting that he occupied it.

It is interesting to find in the career of Mr. Waterhouse who excelled in plan, and (as *The Times* says) "Seemed able to grasp and deal with every practical problem in building as soon as it was presented to him", a confirmation of the doctrine that it is the architect who opproaches architecture in the spirit of an artist who (rather than the practical man so much esteemed by the cautions) is the sound workman in building. The *Builder's* pregnant account of Mr. Waterhouse is an ideal description of an architect,—"With a quickness of perception in regard to planning, which long practice had developed almost to a intuition, he was able to carry out buildings on a large scale almost as an improvisation, seeing at a glance the key to the whole treatment of the scheme and clothing it at once in an architectural garb".

It is, however, odd that the quality of beauty in detail is lacking in his work; both in composition and superficial effect it seems to be overlined. Here is an extract from the diary of a student, fresh from the office of H. H. Richardson, who visited Eaton Hall, (rebuilt by Mr. Waterhouse for the Duke of Westminster), in 1886, a few years after it was finished;—"I have carried away chiefly a perception of the scale of requirements in such an establishment and of excellence in the plan. The ornament was also carried out with the greatest possible taste, there being no bare spots, and no overloaded places. Yet I got not the least pleasure from the detail, but rather discomfort. It was consistent and scholarly Gothic. Indeed it was more than scholarly, it was masterly; handled in the freest and most skilful manner in adapting it to modern requirements. Nevertheless I was continually oppressed by a sense of architecture. When the clerk of works brought me in triumph to the supreme effort—the main staircase in the Duke's private house—I felt my heart soften towards the [illegible] utterly wretched. And yet it is clearly great work. It is good ideas expressed in abominably uncouth, affected English." This seems to express pretty nearly the mixed feeling of Englishmen towards Mr. Waterhouse's Gothic, and the disfavour was continued to later work in another style which is still described as wanting in repose. It is likely that the softening hands of time will improve the appearance of his work, and what now seems to be technical excellence a little hard will then appeal to taste. An examination of mediaeval Gothic often leads one to the conviction that, when it was new and cleanly cut, it also must have been a little hard.

Art and Advertising at the Toronto Fair.

The National Exhibition came under our notice this year because of its large offer in the way of art treasures and paintings imported from England and France. The offer was not fulfilled in the way in which the preliminary advertising would lead anybody to expect. The terms in which the public were informed of what they would see in the way of Royal Art Treasures at the Toronto Fair are to be found on p. ii of the July number of this journal, where a quotation from a circular purporting to come from the Directors of the Exhibition, (but which, of course, we cannot prove really came from them or was anything but the manifesto ot an unscrupulous postman), first prepared the mind for something extraordinary by making a disparaging reference to the Jubilee presents, viewed in comparison with this present lot of royal treasures, first in the matter of attractiveness and secondly in the matter of bulk. The comparison of mere bulk was made as "a statement that will convey to many people some idea of the number at least of these antique relics that have been gathered from the art repositories of the castles of the King, of the ancient and renowned corporations of London, City of Oxford, Cambridge and Dublin Universities, and from the wonderful collection in South Kensington Museum." What was there was simply a collection of casts made from the treasures above specified by the branch of the Education Department at the South Kensington Museum and gilded or silvered by them to represent the material of the original. It is bad enough to have a grossly deceitful advertisement of this kind circulated as coming from the directors of a semi-municipal affair like the Toronto Exhibition but it is equally disheartening to find that not one individual or one newspaper has said one word in protest against this way of promoting the Fair. If it is understood that about the exhibits the Directors are to trifle with the public and that we are to get together there (at some expense) merely to see a principal show of a variety character and sideshows of characters which "vary mostly for the worse"—it may be understood, but it is a pity that it is so.

What the fraud on the general public who were to see objects interesting, as the circular promised them to be, for "richness" and "historical connection" injures the nation's honour which is more valuable than its art, it cannot be denied that models of this kind would be a help to art. Not so much these particular models—they were too many of a kind and the kind was too elaborate and costly for this country—but models such as are made at South Kensington of all kinds of art treasures:—Gold and silver work, [illegible] plaster work, gesso, &c., would all, if well selected, be of great use in developing the manufactures of this country. The principal condition for obtaining loans of them would be the establishment of a museum or other proper place where they could be received with some certainty not only if being properly taken care of but of being properly used. On what conditions we might even then obtain loans is not certain, but that so many models have found their way here once is an encouragement to hope that others of a more practical character could be got here again. A loan or two might be required to introduce the idea, but there is no reason why, that being done, we should not aim at getting what we want by purchase. Indeed the models shown at the Fair may suggest to manufacturers themselves the idea of trying to place an order with the Education Department at South Kensington for models that would help their work. The Department has a photographic catalogue of its productions in this line.

AN AMERICAN GOTHIC REVIVAL.

Mr. Ralph Adams Cram, in a series of three notable papers in *The Brickbuilder*, has been preaching a Gothic crusade; not altogether as a voice crying in a wilderness, but rather leading on a host already engaged in the new movement.

Gothic was true architecture while Palladianism was a sham, so that one is chary of raising an opposing voice against any movement that looks for its ideal to the Gothic centuries. But, in the larger sense, Gothic architecture is not merely the architecture of the middle ages, nor is Palladianism merely that particular perversion of Greek principles for which Palladio is distinguished. It is possible to apply the Palladian method to Gothic forms, and it looks very much as if only Palladian Gothic will be produced by the army of converts to fifteenth century design, which gives so much delight to Mr. Cram, but which one cannot be accused of cynicism in recognizing, (by name, some of them), as the usual following of a new fashion in American architecture. "The work of restoring and revivifying Gothic," Mr. Cram says, "is proceeding with leaps and bounds". We are sorry to hear it; it could not do a worse thing. To Mr. Cram this mysterious movement is a growth "out of the persistent soil of inextinguishable inheritance and under the sun of dawning spirituality". He hopes all things because his heart is with the movement, but the examples of current Gothic, in the illustration sheets of the very numbers of *The Brickbuilder* in which his articles appear, incline us to retain our less charitable opinion. There are no doubt spiritually minded men to whom Gothic represents, as it does to Mr. Cram, the "Christian architectu[illegible] for [illegible]y, to [illegible] it represents a fashion to [illegible]wed, the animating spirit is the spirit of Palladio. Mr. Cram's own churches have for some time been to the profession, an enviable attainment; and his West Point success has brought the thing to a crisis. The supply has created a demand, that is all. It is a fashion, not a movement.

Mr. Cram thinks this is the gist of his three papers—that the time has come to cast off the paganism of [illegible] again with the fifteenth century when the course of Christian architecture was in- [illegible] and it must work advance from precedent". This is how he brings the question to a definite point—which is what it needs. General principles are nothing. Mr. Cram's general principles are unquestionable; but so are everybody's. Even Mr. Flagg is probably a pure minded person. But trouble comes in the application of principles to style. Mr. Cram's idea is that "style is nonsense unless"(in the first place) "it develops from historical and racial associations". He claims continuity of race with the English, and affirms that, since with the Suppression of the Monasteries in England the racial style died, it is with architecture as the Suppression found it * that we have to do.

This is a clear enough programme. Is it true? It is not quite new. Ruskin, whom Mr. Cram considers to be "quite the worst critic and exponent of architecture that ever lived" has already advocated the adoption of the Perpendicular as the basis and starting point of a true English style. His proposition was not taken up. Is Mr. Cram the appointed agent to carry out Ruskin's idea? We should be glad to think so. Our sympathy is entirely with Mr. Cram in his desire to make architecture, what it ought to be, "a language, not a sequence of fads." Mr. Cram is a brother; but brothers, when their positiveness is stronger than their argument, are sometimes rather irritating.

Mr. Cram's whole discourse is a process of begging the question. To begin with, is it right to say that mediæval architecture alone is "Christian architecture?" If it is, is not an accompanying condition implied that the mediæval church alone was the christian church? That statement would be rather confusing to some tens of millions of Mr. Cram's fellow citizens who do not share his obvious regret that the Reformation succeeded. The question is still further confused by the fact that the mediæval church (which still exists) finds itself quite at home under the dome of St. Peter's, housed in an architectural style of which Mr. Cram speaks in unmeasured terms with which we have too much sympathy to quote them against him. It is idle to regret the Reformation, disturbing as some of its consequences seem to be. Erasmus was not conspicuously a saint of God; Luther was certainly not a work of the devil. The ways of the Lord are wonderful; and one of them, which Mr. Cram and others have a way of entirely over-looking, is the development of Greek thought. Greek philosophy has not been unrecognized; it was indeed all important to that very mediæval church which gave us the "Christian architecture." And had Greek architecture no place to fill in the Christian world? One of its sources of origin, it cannot be doubted, was Solomon's trabeated temple, which is the only church that was ever built of which we [illegible] any more warranty that the mind of God was with it.

Not to go any further into the [illegible]oth of speculative argument than just to claim recognition for the Greeks, let us see what may be the consequences of this. Here of course, in the application to style, is the place where, as usual, untruth may creep in; but the acknowledgement of Greek architecture, as having an intended place in the progress of the world—of the Christian world, for it is all Christian now in spite of the pre- [illegible]ce of the heathen—seems to us the acknowledgement that there is a true architecture of con- [illegible]med construction. It is [illegible] usual to talk of [illegible] if the construction followed mere necessity and its beautification by its treatment in detail was the whole method of the designers. Proportioning the construction is always the essential element of design in the mediaeval styles; decorative finish is equally essential but subsequent and minor. St. Paul's and Westminster Abbey are equally a matter of proportional construction, as far as the interior is concerned, and the present writer confesses to more exalted feelings in the greatness and simplicity of St. Paul's than in the comparative littleness and positive complexity of Westminster Abbey. The pointed arches of the Abbey, piercing almost to the triforium sill, are an annoyance and a constructional annoyance; the ragged Corinthian capitals of St. Paul's are only a matter of detail that might be corrected—and that is what we humbly propose as our contribution to this subject.

It is useless to speak of Wren's architecture as heathen; it is not. Some of his churches, that have been modernized in arrangement, appeal as perfectly to

* i. e. with the fully developed Perpendicular or Tudor style.

the devout as any churches in the world. One of them is occupied by a congregation with perhaps the most mediaeval service in England; and the perpetual smell of incense in the church sets it apart as a sacred place, even to one who abhors the use of incense in the service. But there is no satisfaction in "the Renaissance box of bricks" which were Wren's only repertory of detail. The question is, do they constitute classical architecture any more than Gothic detail makes Gothic design?

The essential principle of classic design seems to us to be the construction of form—the Greek principle. This is not absolutely either true or false; it may be either. Let us assume its proper use and see how it will fit the Gothicist's conditions of architectural style as set forth by Mr. Cram. Apart from a general exaltation of the need of harmony, proportion, etc., common to all styles; a general denunciation of archaeology and imitation; and a special damnation of the Renaissance—the conditions upheld by the Gothicist are "that architecture is a language, not a sequence of fads, and that style is nonsense unless it develops from historical and racial associations, expresses construction, function and contemporary ideas, uses honest materials honestly, and is intrinsically beautiful, both in detail and as a whole."

Admitting the truth of all these items, the point to be wrestled with in classical design is the expression of construction.

The point the Gothicist will have to wrestle with (we may just mention it in passing) is the expression of contemporary ideas; and we must respectfully express a doubt whether Mr. Cram is doing it in the narrow spans he gives his churches (those shown in *The Brickbuilder*.) It may be necessary to contract the span in order to meet the requirements of a tie-beam roof that will give the true Tudor effect. But is not this resurrecting his style to much in the body in which it died. "It did not die", he says "but only retreated to the sanctuary of the Island of Avallon with King Arthur and all the other inextinguishable truths." Inextinguishable in truth it may be but not in form. "Arthur has come again," Tennyson assures us, "in some manner like a modern gentleman", and should [illegible] which also retreated to his sanctuary appear again in a form more expressive of "contem-

The contemporary idea of architecture is that it should be fireproof. This was not so in the fifteenth-sixteenth century, nor was it so in the time of Wren; but it was the generating force in the development of pointed archihitecture, and there is every reason to find in it the cause that will develop from the Perpendicular (the most delightful and suggestive as well as the last of the English styles), by way of the models Wren has left us, a style of church building which will fulfil the conditions of true design, and not be alien, as mediaeval Gothic is, to our modern life.

Apart from the question of fire-proofing there is still difficulty with the roof. The mediaeval church inclined to a narrow habit in spans. Our inclination is to a wide habit. On this score also a wooden roof is not in accord with modern life; and an architect, to whom a true mediaeval wooden roof is a necessity of church design, will find difficulty in stating his position fully to the building committee of his church. Iron cased with wood is good enough for them. He loses frankness in his dealings with them in the matter because he has no argument that will convince them; who, as he bitterly reflects, are altogether possessed by modern ideas. If he will only reflect a little longer, until he becomes aware that it is he who is not possessed by modern ideas, is in fact archaeological, he will perhaps recollect that this is a habit of mind that is denounced in the Creed of the Gothicists and will turn his mind to making a design in accordance with modern ideas. Iron for his roof is the first consequence; and the second is concealment, for iron is neither fit to be seen nor safe when exposed. He is now modern and may congratulate himself that he so far fulfills the condition of his Creed that his design is based on contemporary ideas. The expression of construction and of function remain to him. The latter is largely a matter of plan, which we may assume to be right, and of details and ornament, which need need not be heathenish though the principal of design be—what it seems to have become—Greek.

One cannot affirm with certainty how the problem of concealed construction is to be treated. Invention is at work in building material, in great part in order to meet these very conditions of modern life—the employment of iron in construction and the desire to build fire-proof. We may conceive of our church designed in some casing material—a condition no different from Wren's in the city churches. We may think of reinforced concrete, with an exposed construction not at all (in the bridges that have been built of this material) unsuggestive of a sort of work that would follow on well from the last stage of Gothic architecture in England. But in any case it is a question of vertical pressure on vertical walls, and any structural form into which the walling [illegible] cast [illegible] be designed not to enable the wall to carry its load the better but to express better the fact that it carries it.

This is the architecture of modern life. Not the display of function but its expression, and, if a man is to speak the language of his times in architecture, that is the language he must learn. So far the Renaissance box of bricks has been our only means of expression. The real ground of its invariableness has been the conviction that the proportion of parts in an order is inviolable. This conviction does not now hold the best designers. The orders are not [illegible] of blind

fellow-countrymen to find a new and more Christian language in the open phrase book of Gothic architecture, and we sincerely hope they may do so. But the style of architecture to which it must be applied will, it seems likely to us, be, if it is truly modern, Greek in its principle of design.

It seems that the word "pediment" which, because it seems to to have something to do with the foot, is so confusing to people who know but a little about architecture, has had its derivation made clearer by the Oxford English Dictionary, in the seventh volume, which has been recently published. Early examples of the use of the word show that it was written "periment" or "perriment" and Dr. Murray thinks that this word was "a workman's corruption of pyramid, which a triangular gable sometimes resembles in section, and which is actually pronounced peremint or purriment by the illiterate in some districts at the present day. He gives the genealogical succession of the word as "pyramid, peremint, periment, pedament, pedement, pediment." The jump from periment to pedament seems to have been caused by the educated (Evelyn uses the word) because there happens to be a Latin word pedamentum meaning a prop, usually used of a vine stake.

OUR ILLUSTRATIONS.

THE CANADIAN BANK OF COMMERCE, EDMONTON.—MESSRS. DARLING AND PEARSON, ARCHITECTS, TORONTO.

In construction this design is a combination of gray stone and red brick. It has a stone base, stone columns and doorway, and a wooden cornice in scale with and painted like the stone. Stone work is mingled with the brick for the key-stones, imposts and sills of windows, and in the quoin-blocks and caps of the chimneys.

The design exactly expresses the idea it ought to convey—that of a country-town bank, in which the banking office is on the street level and the upper floors are a residence for the manager. This half domestic result has been attained, not only by the domestic windows of the upper part, but by great simplicity and refinement of detail.

MAIN ENTRANCE TO C.P.R. STATION, WINNIPEG.—MR. E. MAXWELL, ARCHITECT, MONTREAL.

The materials of this design are red brick, imported from Wisconsin, and gray limestone from the Garson quarries, near Winnipeg.

The treatment of the order deserves study. It is due to the design of the rest of the front to say that the photograph does not do justice to it. If this part is examined through a magnifying glass, (a most useful instrument in an architect's office), the confused appearance, presented in a more distant inspection of the plate, disappears, and it can be seen that the two-storey window opening is framed by an architrave band of projecting brick. When this is grasped the springing stones cease to look spotty—an illustration of the added force which a visible function gives to decorative detail. The corbel or drop, under the shield form in cornice, is the root of the trouble, beca[illegible] [illegible] capital and produces the ill[illegible] [illegible] tween the windows. If this had less width than the shield projection above it, or were omitted altogether, it would be better.

The dignity of the order which composes the entrance is due, in great measure, to the unusual size and broad proportion of the dentils and to the fact that the corona carries through. The dentils are mounted by the insertion of a roll between them. The swagged capitals are a good enrichment and give the necessary

[illegible] [illegible] [illegible] [

SKETCH OF CABLE AT ORIENT

BY E. STANLEY MITTON.

WHAT I WANT IN MY HOUSE.

BY A HOUSE-KEEPER.

On deciding to remove from the country to Toronto for the sake of educational facilities, we were warned that we should experience great difficulty in finding a house. This has proved to be the case. And after a lengthy and fruitless search, we have determined to build for ourselves.

In our country house we enjoyed ample space and light and air. But these are all costly luxuries in a large city, and we must be content with [illegible] and as the plot of ground on which it is to stand is long [illegible] we should like, and all cannot be equally well lighted.

In planning for this city house there are several points in which it must differ widely from our former home. Having neither garden nor orchard, there is no need for a cellar, large enough, and cool enough, to contain a winter's supply of apples, potatoes, &c. Nor do I require a store-room that will hold hogs-heads of sugar or chests of tea. All such things can be obtained in small quantities day by day, or week by week from the various tradesmen. My cellar here will contain a furnace (a combination of hot air and hot water) with the season's supply of feed for it, and for the other fires.

This furnace and coal cellar should be solidly partitioned off from the laundry or servants bath-room, and should have a separate entrance from the outside, for the use of the man who attends to the furnace.

A fourth good-sized division of the cellar, also separate from the furnace room, and well lighted by two or three windows, may be useful as a store-room and work shop. Plenty of shelves will be required.

Coming to the first or ground floor, I wish to have my house somewhat differently laid out from the ready-made houses, of which I have seen and rejected so many, since I arrived in Toronto. The usual plan of having all the rooms on the ground floor *en suite*, is distasteful to me.

Much space is generally wasted in "a square reception hall", and it is sought to make up for the consequent cramping of the living-rooms, by arranging them to open into one another by wide double doors. The drawing-room, dining room and library are practically all one room, and the dining-room generally communicates directly with the pantry and sometimes with the kitchen!

To my mind the hall and passages are the only proper means of communication with the living rooms, which should each be separate from one another, and should only be entered from the hall.

To this end I wish the hall to occupy the centre of the house, with the drawing-room on one side of it and the library and dining-room on the other. A door, with a patent check of cup and ball construction, to prevent it from banging, should separate the front hall from the back; the back hall being little more than a passage, leading on the one side to the kitchen, and on the other to the pantry, with the back stairs between. Another door, also with cup and ball check, should here give access to the dining-room, so that the family meals are not carried through the front hall.

In this house I cannot spare any of my scanty space for the large roomy hall, so characteristic of country houses. I need every available inch for the living-rooms. So my hall is but a space in which to carry up the stai[illegible] into which the rooms open. But it has w[illegible] valu[illegible] we come to hang the pictures. Photo[illegible] of foreign places, engravings of historical pictures, and maps, I think most suitable for a hall.

My drawing-room is never only a company room, whether in town or country; we live there habitually, and have no upstairs sitting-room. Therefore it must be the largest room in the house and well warmed and lighted. An open fire-place is essential, in addition to radiator or register, and the windows must not be darkened by a verandah.

The library and dining-room must be [illegible] probably suffer in the matter of light from the near neighborhood of the next house. And we may find it necessary to omit a separate library altogether and allow our student a table and book-case in the dining-room, which will be a better-sized room by this means. A verandah at the back of the house may open from a side window of the dining-room, and will be more private than if it faced the road. The kitchen will be small but compact, and the stove will burn coal or wood. Some people use gas. But I think a kitchen with only a gas range is a cheerless place. I shall however have a small gas stove in my pantry—which I prefer to call my still-room. It is true that I do not now distil essences or strong waters there, but I do make all kinds of jams and jellies and put up all the canned fruit with my own hands. So a gas stove will be useful, and with a sink, and hot and cold water at hand, I need never interfere with the rightful occupant of the kitchen.

The still-room will have cupboards all around the walls for the glass and china of daily use, as well as for best china, and other seldom-wanted household

gear. There will I hope be enough room for the jam and jelly pots, the cellar being too damp, and the attic too dry for them.

The back-door opens into the back passage, close to the kitchen and on the other side of the passage is a very small larder, which will contain a refrigerator built as a fixture to the house, with a door for the delivery of the ice from outside. A good-sized safe, covered with wire netting, and mounted on brackets, with room for a barrel of flour under it, will take up nearly all the remaining space in this tiny larder.

Going upstairs to the bedrooms, I should like to have at the half-way landing an oriel window, fitted up with shelves and stands for house-plants. We shall miss our country greenhouse, and this will be a sorry substitute, but some green growing things we must have, and I think this window full of ferns or begonias will look pretty, both from the upstairs and downstairs hall. If possible I should like to have an open fire-place, two windows, and two hanging closets in every bedroom. But this cannot be contrived within our limits of space. However four of the seven rooms on the two upper floors will have fireplaces—two on each floor—and there must also be a bathroom on each floor. A small linen-room lighted by a window and fitted with drawers and cupboards will hold all my stores of house linen. A housemaid's closet will find a place in an angle near the back stairs, and on the upper floor a closet over the linen-room will have rows of hooks all round it for hanging evening gowns, and a shelf for hat-boxes. One of the fireless rooms will serve as a trunk room, or a refuge for some of those superfluities which we are certain to bring with us in spite of the most rigid resolutions. Our furniture is mostly old-fashioned and some of it is still good enough to accompany us on our flitting. But one of the upstairs rooms, to be occupied by our student, has a recess which will accommodate a wonderful series of drawers and shelves—fixtures to the house—long shelves for coats, shallow drawers for shirts, a compartment entirely devoted to trousers, and boots and shoes in a cupboard to themselves, all to be closed behind doors. The house will be wired for the electric light, with brackets beside every bed, and I hope the da[illegible] not far [illegible] beg[illegible] the carpets.

CHARACTER IN PARK DESIGN.*

There are so many gentlemen here to-night who have had much more experience and broader problems of municipal improvement to deal with, that it seems presumptuous on my part to attempt to say anything about Park Design which may be considered of any value, but I sincerely hope that something in my paper may give a clearer conception of Park Design to some, and also that a discussion may follow in which I may benefit from your experience.

Rather than attempt to cover the whole subject of Park Design, I thought it better to consider that important principal of all good designs, Individual Character. It seems to me that if there is one thing more than another which is always pleasing, it is to go through a Park with a strong individual character of its own, whose expression is varied and yet harmonious. That Park is certain to give the most pleasure and accomplish the most good for humanity, which while it is designed to care for every practical necessity of the people still preserves a definite character of its own, varied in its expression. It has been demonstrated over and over again that public parks are not only great benefactors, but public necessities in all large cities. What would London do without her large Parks? What would New York do without her Central Park? People whose lives are lived among the bustle and strife of a large city require some place where they can rest after the days' exertion; mothers with little ones, whose life in the narrow tenements is ill-suited to fit them for life's battle; to all these what a boon are the public parks, where the air is at least more pure than in the street, and the children can romp on the grass or roam through the woods. But it is asked what has Park Design to do with all this? Is it necessary that a Park should be designed for such purposes. The constant familiar observation of surroundings cannot help but have some influence; especially upon the younger members of the community, and if these surroundings are untidy and careless, they must influence to a certain extent one's after life, while the same is true if one's surroundings are neat, beautiful and artistic. Aside from this, with a little care, it is as easy to see that our parks are designed in an artistic manner as in a careless slip-shod way. And is it nothing that the tired business man, or the over-taxed mother can walk or drive or sit and rest in the Park, and feel soothed and rested by its quiet and beautiful scenes.

Parks are so different, both as to their natural conditions and the requirements of those who are to use them, it is impossible to follow any definite rules in preparing a design, but there are certain general principles which we can perhaps discuss to advant[illegible] Taking it for granted that the land is already in possession of the City, and that we are not concerned with its selection, the first thing to be done is to study the proposed park and the locality so that we can bring sound judgment to bear as to the practical consideration involved by the use which must be made of the park so that it will prove most valuable to the citizen. After a thorough examin[illegible] we shall probably find that it has some dominant natur[illegible] character may be especially strong, as is the case with our own Mount Royal Park, while other parks may seem to possess no very strong character, but whether this is so or not, our first step after a thorough study of the problem should be to fix firmly in our minds the dominant character of the park, and if the park is large there may be several different features, but it is always best to have one more important than the others, with the others if possible leading up to it. This chief feature may be a mountain from which can be had extensive views, a beautiful wood, an open plain, extensive water, or it may even be supplied by history. With the chief character of our park decided upon, everything must be as far as possible subordinated to it, and made to accentuate it, making it more impressive and pleasing. The drives should be laid out so as to exhibit to the best advantage this chief feature, while at the same time they must be located so as to serve the best practical purposes of the park, and be of good grade. In like manner the planting, location and construction of shelters and other buildings, should be considered first of all as to their effect upon this dominant

* A paper by Frederick G. Todd, Landscape Architect; read at the Convention of the American Municipal Society in Montreal.

character of the park. We in Montreal are all very proud of our Mount Royal Park, and I should like to use it as an illustration of what I have endeavored to explain to you. We are not troubled here as to what is the chief feature of the park. The park includes the whole of the top of Mount Royal and much of its side slopes, and I think I will not be disputed in saying that it is naturally one of the finest, if not the finest city park in America. Nothing we can do can change the dominant feature of the park, and yet there is just as much care necessary in treating this park to bring out its magnificient possibilities, as would be required to lay out a park on level ground, indeed, greater care is required, for there is always the temptation to make a show so that people will see that something is being done, whereas the most pleasing way would be to have everything done in such a way that one would suppose that nature herself was responsible. I think that you will all agree that the general design for Mount Royal Park is excellent. The drives being located in such a way that they ascend the mountain by incredibly easy grades, and at the same time exhibit the views from the various parts of the mountain to the best advantage. As time goes on, Nature will with what assistance is being given her, cover some of the scars made in building the drives, while plans have already been asked for a Lookout and Café on the mountain to replace the present inharmonious structures. We might well spend the entire evening on Mount Royal alone, considering the design for the drives, how they were laid out by the late Mr. Olmstead, to take advantage of every view and finally culminate in that grand and impressive view to be had from the Lookout. How the [illegible] should be best constructed to form an important [illegible] feature, without intruding too much of its own personality. How the cutting of a few trees here and there would open up important vistas, and the planting of others would increase the beauty of the park. But it certainly would be questionable politeness on my part to devote so much time to our own park, and aside from this, there are a number of other parks which I want to just touch upon.

The Plains of Abraham at Quebec, which were set aside as a public park a short time ago, present an unusual opportunity of making a fine public park of great interest to the general public of not only the whole of Canada, but the United States as well. Nothing can prevent the magnificient views obtainable from these Plains from being the great characteristic feature of the Park, but the whole Park is so bound up in the History of this continent that the opportunity of designing the Park in such a way as to perpetuate this history, would seem to be much more interesting than to lay it out as an ordinary Park, with clumps of trees dotted about, and the whole cut up with walks and drives. Almost any town or city can have just as good flower beds and shrubs, just as well made walks and drives, as can be had on the Plains of Abraham, but few other places can command such magnificent views and to no other park can the history of the Plains of Abraham be given. Therefore it is not difficult to decide that we must provide drives and walks along the mighty precipice, (up which Wolfe scrambled with his army), in order that we may obtain the views, but as the chief pleasure of this Park will be derived from that portion of it along the precipice, the rest of the drive might well be confined to the borders of the Park, leaving a vast military park in the centre. In the laying out of the Park and in the nomenclature used everything might be done with the object of perpetuating the valor of the two armies who struggled here for the control of the continent. In this Park flowers, trees and shrubs of all kinds must be considered as subordinate to the general design. Trees and shrubs there must be to give shade and to give form to the design, but they should only be used in such a manner as to make the design more effective, and not scattered over the Park.

Where water is present to a large extent in the Park, it is almost always pleasing to make this water a chief feature of the Park or at least that portion of the Park where the water occurs. There is a particularly good example of this in Boston in the Back Bay Fens. This land, formerly overflowed by every tide and alternating between a beautiful pond and an illflavored marsh, has been changed into a beautiful park by the building of a dam so that the water is retained at the same level. In this Park the water has been made use of to a very pleasing extent. The drives as well as the walks have all been laid out so as to make this waterscape as effective as possible from different points, and the planting further carries out this pleasing effect by a particularly pleasing sky line, which, as it is reflected into the water, becomes doubly important. The Kew Gardens in England, are remarkable for the beautiful manner in which the water views are treated, and this is mostly due to effective planting. Another Park which includes a great deal of water, and which promises to be the most beautiful waterway Park, is a Park situated at Stratford, Ont. The Park Board there has been unusually fortunate in securing the land along a wide stream from the centre of the City to an outlying Park a quarter of a mile distant. This stream of water is not large, but owing to a dam which is within the Park property, the width of the sheet of water varies from 150 feet to 600 feet, so that the drives along its edge should be very effective. In this Park the planting must be one of the chief features as upon the skyline with its corresponding reflections and the framing in of vistas, will depend much of the beauty of the Park.

In The West where the parks must necessarily be located upon the open prairie, and where as the land the open surface is only partly rolling, it is perhaps more difficult to decide upon the chief character of the Park, but in one example I have taken the open plain itself. The Park is of some three hundred acres in extent, and it seems to me that to endeavor to make this open plain more effective would be better than to attempt to obtain a park which would have for its chief feature the woods or any modification of the topography of the ground which could be made; but to render this plan the most pleasing some contrast was obviously necessary. Therefore I suggest an entrance directly into the large formal court which would have for its chief feature a water basin 600 ft in length. This court was entirely shut in from the rest of the Park by a formal circle, hidden again on the outside by an irregular planting of trees. Within this court everything was formal and flowering shrubs and flowers and bedding plants are intended to form a part of its decoration. The whole formal court is made perfectly level, and in doing this the far side is raised four or five feet above the surrounding Park, and by terracing up this portion, it is made to appear even higher. The drive after encircling the formal court emerges on this terrace from which there is an unbroken view for the distance of about a mile to the far end of the Park where it terminates in border a plantation. Groups of trees are scattered in the foreground and at intervals over the Park in order to give scale and distance to the view. After leaving this formal terrace the drive encircles the Park, one branch following along the bank of the Assiniboine River, and through a thickly wooded portion of the Park, and returning at the other side of the park, skirting along the border plantation through groups of trees.

I have endeavored in these very sketchy notes of several different parks to point out how desirable it is that our different parks possess some individual characteristics which shall make them interesting for their own sake and not because they are similar to some others, and the great key to success in this is to allow ourselves to become so imbued with the love of nature in her most interesting phases that we shall unconsciously work in harmony with her in all we attempt to accomplish.

COMMON DEFECTS IN EXISTING BUILDINGS.

Aside from inadequate public fire protection, the fire record of a city and the danger of fire spreading from one building to another (the "exposure" or "conflagration" hazard), there are many defects in buildings, and other conditions which effect the chance of a serious loss, for which charges are made in underwriters' schedules. They are as follows:

Side or bearing walls not of standard thickness.
Party walls not of standard thickness.
Walls not [illegible]
Poor quality of brick.
Poor quality of mortar.
Iron fronts.
Slate roofs.
Shingle roofs.
Mansard roofs.
Concealed spaces in roofs.
Floors not of standard thickness.
Floor supports not standard.
Combustible sheathing on walls.
Combustible sheathings on ceilings.
Excessive ground floor area.
Excessive height.
Elevators not properly enclosed.
Stairways not properly enclosed.
Well holes, hatchways, etc., not properly trapped.
Wooden chutes, dumb-waiters, ventilating shafts and other openings through floors.
Skylights of excessive area with wooden frames and glazed with thin glass.
Wooden cornices, wooden dormer windows, cupolas, monitor roofs, large wooden signs.
Wooden awnings.
Lighting by unapproved method.
Heating by unapproved method.
Chimneys of unsafe construction.
Streets not paved or otherwise inaccessible.
Streets of standard width.
Overhead electrical wires strung in streets.
Multiplicity of tenants.
Age and repair of buildings.
Wooden rears, extensions, etc., on brick buildings.
Stone piers, stone columns, pillars, or brick piers with bond stones, carrying important weights.
Unprotected iron columns.

FAULTS OF MANAGEMENT.

Besides structural defects which may make a building uninsurable there are faults of management (the personal element) which also affect the chance of a serious loss, to wit:

Stovepipes not properly arranged.
Floor under stoves not protected.
Bottom of elevator shaft used for store-room, coat closet, or lamp and oil closet.
Swinging gas brackets.
Untidiness as to rubbish, ashes, etc., especially in cellar.
Packing material not in bins.
Cracked or bulged walls, bond timber in walls, thin and worn floors, broken plastering exposing lathing, broken windows, especially on lower floors.
Empty boxes, rubbish and barrels in rear yard or alley or in the recess for windows below grade, or in area or cellar openings under sidewalk gratings.
Lights in show windows, open or unprotected, or electric bulbs covered with tissue paper or paper shades.
Sawdust spittoons, or sawdust on floors, especially in drug and oil stores.
Kerosene used on floors when sweeping.
Wooden ash and waste cans.
Woodwork exposed by furnaces.
Fireplaces improperly built.
Steampipes in contact with woodwork and other combustible material.
Crowding of premises.
Neglect of fire appliances.

Extract from article in *Insurance Engineering.*

PREVENTING FROST ON SHOW WINDOWS IN WINTER.

During winter weather many shop keepers experience more or less difficulty in keeping their show windows free from the ice that in low temperature tends to defeat the object of the display. No doubt all of the devices for keeping glass clear of ice, published from time to time in the journals, have received a fair test, with varying satisfaction. A writer in one of the foreign drug journals, apparently a druggist who has experienced the rigors of high latitudes, insists that none of the ordinary schemes are of much use, and that the only certain remedy for the opaque deposit of solid water is a double layer of glass with a sufficient air-space between. He states that applications of glycerine, alcohol, and other solutions are of no avail in extreme weather and that, in any case, they must be so frequently renewed that they become extremely troublesome. In the northern portions of Russia, where zero weather is sufficiently common, experience has taught the owners of show windows that the only effective protection is a three-inch air space between two panes of glass. The outer sash is rendered as nearly tight as possible by calking the chinks and pasting strips of paper over the crevices. The glass is then carefully cleaned and dried on a clear, mild day, and a second sash, fitted with the same care to prevent all circulation of air, is inserted about three inches within the first. The double panes are said to obstruct the view very little. The physical cause of the deposit of moisture and ice upon windows is the difference in temperature between the surface of the glass and the air bearing a relatively high proportion of moisture, which comes in contact with it. —*Scientific American.*

The Robert Simpson Company, of Toronto, has purchased a site in Montreal for the erection of a departmental store. The lot has a frontage of 220 feet on St. Catharine street.

THE VETERAN PAINTER in *The Painter and Decorator* says: I heard the other day of an architect who agreed to draw the plans of a new house for nothing for the sake of the advertisement the work would give him. The owner was fool enough to believe him, and then when bids were asked, the architect went to the carpenter and the mason, the plumber, the painter, and all the other mechanics, and told them how much to add for him. The owner thought the architect was working for glory, but he paid him $2,500 just the same, where the regular five per cent. fee would have been $1,000 or $1,200. It is only another example of the truth that a man is a fool if he thinks he can get anything in this world for nothing.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Builder": Would it be right to stain the floors in a residence the same color as the dark woodwork and finish?

ANSWER.—No, it is not considered necessary that floors should be of the same finish as the woodwork above. Oak makes about the best floor, though maple is very satisfactory, too, slightly stained in the filler to cherry color or oak brown. Very dark floors are not desirable as the dust shows so plainly on them they always look dirty.

From "Workman": I have heard of a tool that will bore a square hole will you kindly inform me if there is such a tool, what it is like and where it can be obtained, and oblige?

ANSWER.—Yes, there is just such a tool in the market, it is called "The Pearl Square Augur" and is sold by a company who have their offices at No. 107 Liberty St. New York, N. Y. We do not know of any Canadian house that keeps them for sale. This is a real augur all the cutting parts boring a hole by a rotary motion not a tool that has to be forced into the wood by pressure. It is the only augur in the world that bores a square hole. Several gold medals have been awarded the inventor.

From "Plasterer": Will you kindly inform me [illegible] being struck, and advise me where a book describing the method may be obtained?

ANSWER.—The centre points from which different arches are struck can be readily found by practical geometry; and any workman who wishes to rise to the higher branches of his trade must not expect to find everything ready for him without any labor on his part. The most useful method of finding centres [illegible] the accompanying illustration, Fig. 1. Let A B be

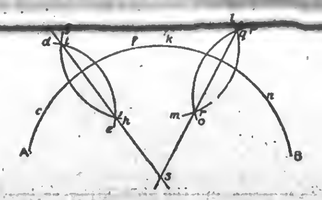


FIG. 1.

part of the curve of any arch; from any point c with a radius c d strike the arc d e, and from any point f with the same radius strike the arc g h to intersect with the previous arc at i and j, then a line drawn through i j will pass through the centre from which the arc curve was struck. Now take any point k and with any radius k l strike the arc l m, and from any point n with the same radius strike the arc intersecting the previous arc in q r, then a line drawn through q r will intersect with the line drawn through i j at the point S, which will be the centre of the arc curve. when the arc has more than one centre, the various centres can be found in the same way, by taking different parts of the curve. There are many books now to be had that show how to overcome this and other like problems, but, perhaps the best for your purpose, is "Hodgson's Modern Carpentry" Price $1.00. It may be obtained from this office.

From "Contractor"; Will you kindly give me a rule for measuring slate on a roof giving the number of various kinds of slate required to cover one square, also please describe a good method of laying slate.

ANSWER.—A very good table for finding the number of slate required to lay one square of roofing is given below. It is taken from "The Builder and Contractors Guide" and is considered fairly correct.

Number of slates required to cover a square of 100 ft.

Size	Lap of 2 inches	Lap of 3 inches	Size	Lap of 2 inches	Lap of 3 inches
12×6	480·00	533·33	20×12	133·33	141·17
7	411·43	457·14	13	123·08	130·32
8	360·00	400.00	14	114·20	121·01
14×7	342·86	374·03	22×11	130·91	137·80
8	300·00	327·27	12	120·00	126·32
9	266·67	290·91	13	110.77	116·60
10	240.00	261·82	14	102·86	108·27
16×8	257·14	276·92	15	96·00	101·05
9	228.57	246·15	16	90·00	94·74
10	205·71	221.53	24×12	109·09	114.29
11	187·01	201·40	13	100·70	105·57
18×9	200.00	213·33	14	93·51	97·96
10	180·00	192·00	15	87.27	91.43
11	163·64	174·54	16	81.82	85·71
12	150·00	160·00	17	77·01	80·67
20×10	160·00	169·41	18	72·73	76·19
11	145·45	154·01			

With regard to laying and nailing slates, there are different ways of doing the work. There is single and double nailing both of which are shown in sketches 1 and 2, Fig. 2; In Fig. 1 all the slates of the roof are

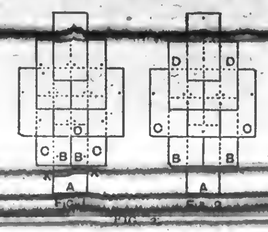


FIG. 2.

fixed with two nails [illegible] suppose slate A to be [illegible] line X Y, and is to be superseded, the first thing to be done is to get out the nails B, to allow the remaining part of the slate to be removed, This can only be done by ripping, as the nails are out of sight. It is now, however, that the real difficulty presents itself. How is the slate to be nailed? The slates in course C will not turn aside, being fixed at two points, the same applies to course D. The thing is impossible let alone unpractical. What is the result? The slate is often fixed with a little cement, or the easier plan is taken of merely wedging it in, a procedure that soon puts the roof in an unsafe, and very untradesmanlike condition indeed. In Fig. 2, we show part of the roof with only every third course double-nailed, which is recognised by all practical slaters to be the best possible manner of slating a pitched roof. At the same time, it is the cheaper method of the two, as there are fewer holes to punch, fewer nails to provide, and less time occupied in driving them in, and for these reasons it is always quoted at a cheaper rate. Let us refer to Fig. 2, and the advantage will be quite obvious it being quite possible to supersede any broken slate in any course whatever. If a slate is broken in course A, it can be easily replaced, for, by slates in B being fixed with one nail at the top, they are easily turned aside, giving free access to allow refixing with two centre nails. When the broken slate is in course B, it can also be replaced and fixed in a practical manner, though course C is the double nailed course, and imoveable. It is only necessary to turn the slate above in course D, and punch the hole in new slate in line with joint between slates in course C, which gives access to boarding. And again, if the break is in the double-nailed course C, there is no difficulty in getting at the nails, as slates in courses D and E are single nailed and easily turned either way. It is found that centre or double nailing every third course gives very good results, as a protection against storms, and also in most cases prevents slates from rattling, the lever resistance of the double-nailed course being sufficient to hold down the two single-nailed courses. It will I hope be seen from the foregoing, that it is not from ignorance that slaters shirk totally double-nailing a slated roof, but simply and purely on practical grounds. Further, a single-nailed slate roof—that is one nail to each slate through-out—is a still more cheap method of slating by reason also of taking less time and fewer nails, and holes.

From "Bricklayer": Is a cement floor better than a wooden one for a stable? Does it cost much more than a birch or maple floor?

ANSWER.—First as to cost. A 4-inch floor of artificial stone costs little or no more than the common plank floor and much less than a maple floor, while considering the wearing properties it is far less than any other material, owing to the fact that when well laid there is practically no "wear out" to it.

In the next place it is sanitary being non absorbent and proof against rats, which are so common around stables. Being laid in a plastic state it can be made ornamental by forming [illegible] grooving it into 6 inch squares where the horses travel. As the material is very hard it is best to stand the horses in the stalls on wooden slats. Door and window sills may be formed of the same material, costing one half as much as stone.

From "Carpenter": Will you please describe through your columns the method or methods of obtaining the [illegible] and cuts for hip rafters by the use of the square?

ANSWER.—There are several ways of finding the [illegible] and cuts for hip rafters by the use of the steel square. Referring to Fig. 3 we find that the common rafter for a 1 foot run becomes a hip for an 8½ inch run, and that a hip for a 1 foot run of the building becomes a common rafter for a 17 inch run. Therefore, the rule that applies to the common rafter also applies to the hip rafter i. e. the run and rise taken on the square will give the seat and plumb cuts. The run and length of the rafter taken on the square will give the side cuts, or taking the scale for a 1 foot run, Fig. 3, it is twelve on the tongue and the rise on the blade for the common rafter, and 17 on the tongue and rise on the blade for the hip. The tongue giving the seat cut and the blade the plumb cut. For the side cuts we take twelve on the tongue and 15⅝ inches on the blade and the blade will give the side cut of the jack. Take 17 on the tongue and the length of the hip, 19¾ inches on the blade and the blade will give the side cut of the hip. It would also be the side cut of the corresponding jack if it be a common rafter. Seventeen is used for a foot run of the hip rafter because the diagonal of a 12 inch square is practically 17 inches.

If we were to use 12 on the tongue for a foot run of the hip, the rise to the foot would necessarily be less than 10 inches. In Fig. 4 we show what the difference is in rise to the foot.

From 12 to 12 is the length of the run of the hip,

and this, taken on a continued line of the run of the common rafter, and an equal rise of the common rafter, set off at a, and a line from this to 12 on the tongue

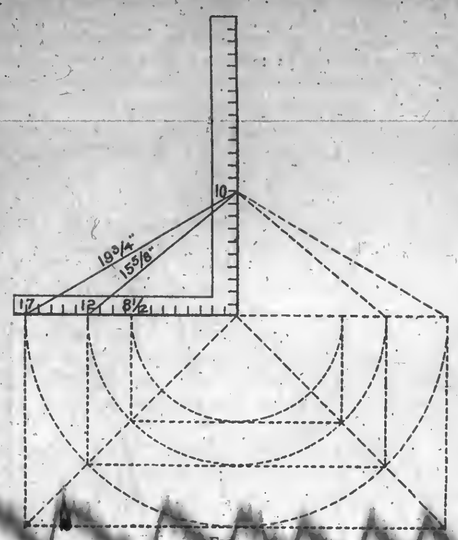


FIG. 3.

passes at 7 1-17 inches on the blade, because the common rafter having a rise of 10 inches to one foot, for 1 inch it would have 10/12 of an inch while the hip would only have 10/17 of an inch to one inch and for

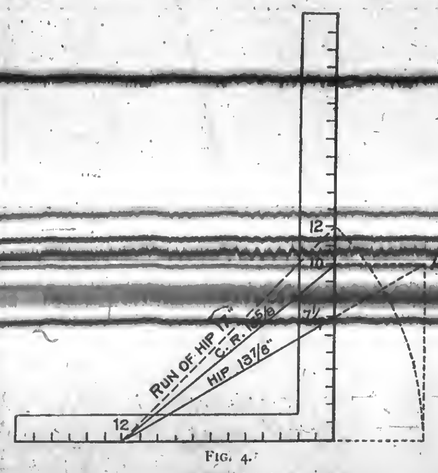


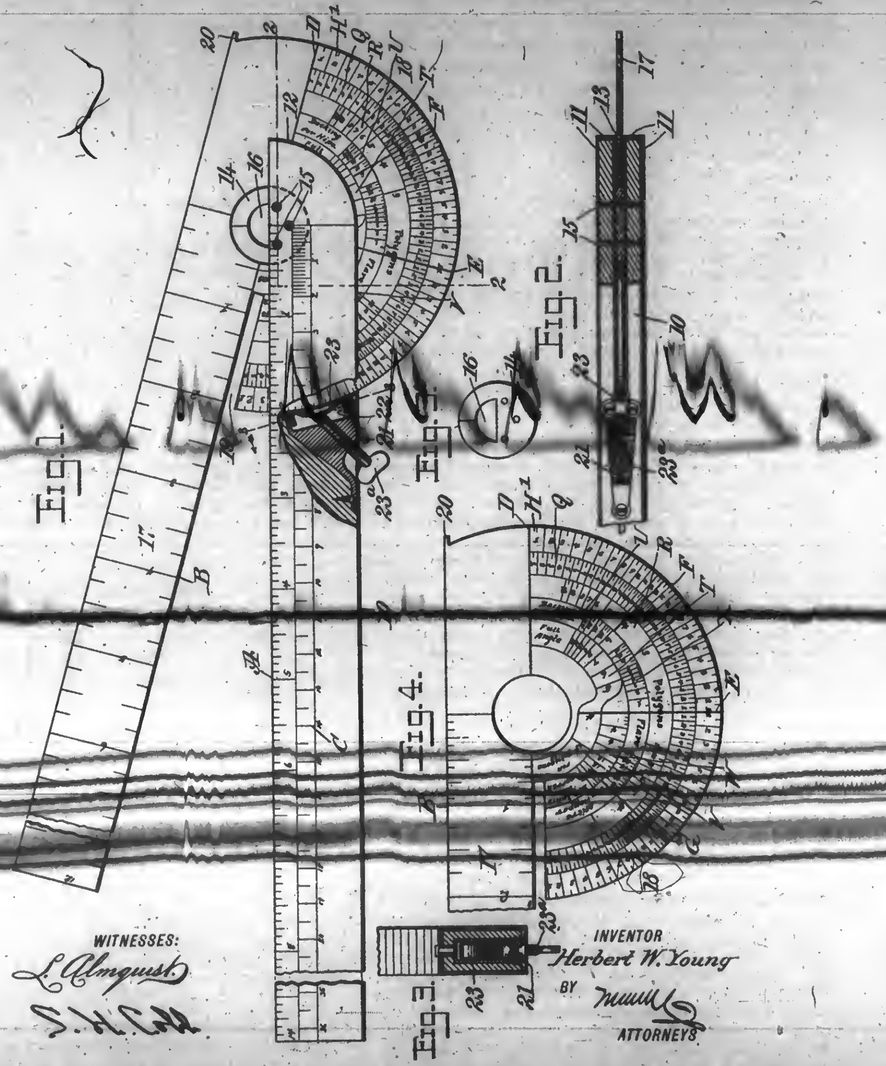
FIG. 4.

12 inches it would be twelve times 10/17 equals 120/17 or 7/17 inches. Therefore the figures given in the second illustration would give the same cuts as those in the first, but as the latter necessitates a calculation that ends in fractions,—fractions not given on the square—and for that reason 17 is generally used for a foot run for the hips and valleys.

From "Builder": How can I refinish an old oak over that is badly weather stained to make it look pretty good?

ANSWER.—This is rather a difficult proposition, but can be overcome to some extent if proceeded with as follows: If possible take the door off the hinges and lay them down flat on some trusses or boxes, and remove the old varnish with ammonia or a mixture of two

parts strong ammonia and one part of turpentine and benzine using a stubby brush to get into the cutwork and about moldings. When all the old varnish has been removed, dope over stained portions with a strong oxalic acid solution, and see whether you cannot bleach the wood by that operation. If this will not work, you will have to resort to staining. Use raw sienna for light effect, and after staining, use paste wood filler, colored to match the stain, then proceed as you would on new work. If the light stain does not hide the weather stains, you will be obliged to use a darker stain and darker filler.



BEVEL RULE.

The above illustration is a bevel rule lately patented by H. W. Young, now of North Vancouver, B.C., and is the only Bevel Rule out. The hinge is so arranged that the scale on both the Stock and Blade always intersect at its center which is always the zero or starting point of the scales. The hinge is also provided with a sector attached to the Blade having a number of scales which give all the bevels necessary for carpenters and mechanics or draftsmen to use, and the figures are so arranged that they can be easily understood by anyone and accurately set to any bevel required. In roof framing it is no longer necessary to do any drafting. Set the blade to the pitch you wish to have the roof and the instrument will give you the exact length and all the bevels necessary for common rafters, hips, valleys, jacks and cripples as well as the sheeting or any cut on the roof. All you have to know is the width of the Building and follow the number you started in with showing the pitch. The same may be said about getting the cuts for hopper and circular work, you don't have to remember rules or how to do it, it is all on the instrument.

Both the metre and the inch scale are provided and either may be used to the same advantage.

Mr. Young intends to have the tool on the market in a few months also a little pamphlet giving a short treatise on framing with the bevel rule with or without the steel square.

MONTREAL NOTES.

At the Convention of the American Society of Municipal Improvement held in Montreal, during the first week of September, one of the speakers, Mr. F. W. Fitzpatrick of Washington, D.C., dealt with the subject of town buildings and the means by which the standard of these may be improved. After dwelling on the importance of fireproof buildings, more especially within prescribed city areas, and on the necessity, of limiting the height of city buildings, Mr. Fitzpatrick concluded by some suggestions as to the taxation of properties. It was his idea that taxes ought be proportioned to the quality of the buildings, but in inverse ratio rather than according to the present system of taxing buildings in, direct proportion to their values. Could such a system be put in practice, it would obviously give great encouragement to the erection of sound and beautiful buildings; but a more obviously just and less drastic method of attaining this end, along similar lines, has long been advocated, and at the present day its advocates are probably rather less sanguine of its speedy adoption than they were at the time the idea was originally promulgated.

The idea referred to is simply that of Mr. Henry George and his followers, the single tax men, whose proposal was to wipe out the whole complicated system of municipal taxes and substitute therefor a single tax on the land, graduated according to the value each portion had acquired from the fact of its more or less advantageous position in relation to the community in which it was located. Thus wherever land in a city was valuable it would be so highly taxed that it would pay to hold it only by placing something upon it which would make it earn enough to meet these taxes. We should not then see vacant and slovenly properties standing about and idly earning large incomes for their holders. Nothing could be more simple or more just, or tend more to the benefit of a city in an architectural sense or to the business interests of its inhabitants; but unfortunately, like many other fragments of ideal justice, it is difficult of realization, and, like many other dreams for the attainment of a high standard of public life, the public interests are here again blocked by a whole [illegible] as at present taxed for improving their property they will be glad to hear of any scheme for terminating such a gross injustice,

Architects will have no difficulty in endorsing Mr. Fitzpatrick's dictum that the buildings are the town whilst the streets and parks are merely adjuncts. Yet even from the architects point of view these adjuncts are of much immediate importance. Location is a prime consideration in the matter of architectural effect, and the difficulty in obtaining fair play for the architectural effect of our streets was emphasized lately when the Road Committee raised the question as to the possibility of abating the telegraph and telephone pole nuisance. This nuisance is going to an exasperating extreme. Our streets are getting to resemble forests of dead trees, and there is hardly a building in the city which one can see otherwise than through a screen of wires. As various companies claim the right to erect their poles and wires without the direct sanction of the city, it was resolved to get an opinion from the City Attorney. The opinion was, in effect, "that these companies have the right to use the streets of the city to erect their poles therein, but the city, by means of the Council, is authorized to superintend the work of erecting the poles." Considering this opinion and the influence which the companies have in high places, it seems as if the end was not yet; and we must walk around and see the posts multiply and replenish the sky without any man to hinder. The removal of this nuisance alone would raise our untidy city ten per cent. in the estimation of visitors; these visitors who, in spite of all our sins as a city, seem to love us still; for the stranger within our gates is very much in evidence during the fall of the year.

The objects which receive the chief attention of visitors to Montreal are, first of all, our mountain which is all glorious at all times; secondly, a number of churches filled with cheap and tawdry show; and, thirdly, our antiquities and old associations, which very few of ourselves seem to care very much about. There is at present on foot a proposal which we fear will involve the loss or serious detriment of one of our interesting old buildings—the Inland Revenue Building. With a view to constructing an addition to this quaint old building, the Government is wishing to purchase a portion of the square in front of it from the City but, this ground being a public park, it is under consideration whether the City has the right to cede any part of for building purposes. We hope not, for the building with its little square, though all comprised in a very small area and without great pretensions, makes a pleasant little spot in an otherwise unlovely locality.

There surely can hardly be two opinions with regard to a city of the extent and wealth of Montreal that it should have public buildings and public collections such as one might be proud to show to its visitors and which would be an education and a delight to its people. There exist the little Art Gallery in the corner of Philip Square—a small Natural History Museum in University street and the Chateau de Ramezay to represent what might and ought to be, each one, a great institution, thronged with people eager to get and able to obtain information and education on a hundred subjects. [illegible] A Public Library is in reality more essential than a public prison, and would prove in every way more [illegible] in reducing the necessity for the other. Prevention is better than cure. These ideas like the single tax scheme, are dreams, but they are dreams which, in most cities with which Montreal presumes to compare herself, have already advanced farther towards realization, and we shall hope that, as Montreal advances in wealth, she will advance in culture and civilization as well.

CONCORDIA SALUS.

BOOKS.

We have received a copy of the YEAR BOOK for 1905 of the COLUMBIA UNIVERSITY SCHOOL OF ARCHITECTURE published by THE ARCHITECTURAL SOCIETY. It is full of drawings which are of course excellent as drawings, but they exhibit also an apparent facility and certainty in academic design which promises that a student who fulfils this course will have at least culture, and bring to his practical work a knowledge of the nature of architectural problems and of architectural language. There are other ways in which a young man can fit himself for an architectural career and it is probably he

who relies most on his college training, expecting it to frank him through, that should take one of the other rough and ready ways ; but for the independent mind, which will in any case produce something better than its food, it is a thousand pities that it should not get the best food, and that, there is no doubt, is the academic training.

BOOKKEEPING FROM A MASTER PAINTER'S STANDPOINT.*

No one will dispute the importance of keeping books of record in any line of business, no matter how small or large, as without some system of bookkeeping how can a business man get at his true financial position trom time to time.

In many lines of business it is possible for the head of the concern to tell at the close of each day just where he stands, and while perhaps this would not be possible in the painting business without an enormous amount of clerical work, yet it is of the utmost importance that an accurate account should be kept of the cost of each job, no matter how small, as a guide for future work, as it often happens that the same work is done again at some future date.

It is just possible that a mistake may have been made in figuring up an estimate for work, and unless strict account is kept of the wages and material, it is impossible to form any idea of what the work cost to do, or to detect an error in figuring if any has been made.

This now suggests to us what might be called two of the most important books an up-to-date painter should keep, viz., a wages book to enter the wages paid each workman on a certain job, and a material book in which should be charged every gallon or pound of material used on the same job.

Suppose a Master Painter who does a fair business and has two good sized jobs on hand at the same time; the one yields him a good profit, and the other proves a losing game. So his business goes on and at the end of the year if he has a credit balance in the bank he thinks that while his profit is not quite as much as he expected, considering the amount of business done, yet his work all paid. Then perhaps after a while he is asked by his customer to do one of his losing jobs again, the same amount of work for the same price as previously charged. He does the work again, thereby sustaining a second loss. Now, how much more satisfactory and profitable it would have been for this man if he had kept these two little but very important books.

Now there are Master Painters who believe that when these books are properly kept [illegible] items represent the cost, and they deduct this from the amount of the contract and consider the balance net profit.

Of course this is wrong, as the cost of conducting a business such as rent, cartage, office help, insurance, heating, lighting, etc., must all be considered and form part of the cost just as much as wages and material.

I have heard of a case where two men went into business with a capital of say five hundred dollars ($500.00). They got along very well together, both working at their trade. When they had finished two or three jobs and collected the money, they charged up what they thought the correct amount for wages and material used, and as they happened to have some six hundred and fifty dollars in the bank, they came to the conclusion that this was profit and promptly divided the one hundred and fifty dollars ($150), leaving the original capital intact. This went along for some time and everything was lovely, but a time came when business became very quiet ; they then had time to collect all their outstanding accounts and also had the privilege of paying their bills. The result was considerably less than the original capital of five hundred dollars ($500.00). This led to a row and a dissolution of partnership. To this day each believes the other to be a thief, and all because proper wage, material, and cost books were not kept.

The amount or percentage to be added to wages and material to cover the cost of these uncontrolable expenses varies from 10 to 25 per cent. according to conditions and the amount of business done, but every man should find out just what percentage he must add.

There in one feature in connection with the average Master Painter's bookkeeping that is sadly neglected, and that is the rendering of accounts promptly for work done. More especially is this the case if business is brisk, as the boss devotes the bulk of his time to looking after his men and the work he has in hand.

All he thinks about is to collect enough money to pay his wages, and when things slacken off he will spend some time measuring up work done months ago, and perhaps when the bills are sent out he has omitted charging part of the work on account of trying to carry all these matters in his mind instead of measuring and charging up the work as soon as it is finished, or within a reasonable time.

Many a man has lost business just through this very thing, as customers expect a painter to render his account as soon as the work is completed, and if, as is the case very often, they have to wait six or seven months after asking repeatedly for an account, the next job may go to some one else, or matters may be reversed and the painter may have to wait six or seven months for his money.

Now as to the different books that should be found in a painter's office. This, of course, depends largely on the size of the business and the conditions surrounding it, but such books as the ledger, cash book, day book, letter book, and time book, and the two very necessary books before mentioned, viz., the wages book and material book, combined with any others that may be considered necessary, should be found in every progressive and well-conducted painting and decorating business, and when a contract is started all material sent from time to time charged against the contract as it leaves the shop. Then a similar account should be opened in the wages book and after each pay day, whether it be weekly or fortnightly, the time should be taken from the time sheets and charged against the proper contract. Then when any particular piece of work is completed, and all materials brought back are credited, a very few minutes will serve to show, by adding together wages and material, plus the percentage for running expenses, just what profit or loss there is in each job.

[illegible] who dislikes very much the idea of keeping a set of books. His system was to charge up his work and keep all his accounts in a small note book carried in his pocket, and his boast was that if he was asked on the street by a customer what the amount of his account was, he could tell in a few seconds; but it so happened that one day our friend lost his note book and it was never found, and to this day that man does not know how much he is out by the loss of his note book, but he lost no time in adopting a simple method of book-keeping to prevert a repetition of what had happened.

We all realize that the conditions governing the painting trade are so different that what would suit one would not be applicable to the other, but the point to bear in mind is the importance of keeping your books in an intelligent manner, having everything in such shape that if anything should happen to yourself some one else could take them up without fear of financial loss through work not having been charged up.

FRANK H. MCCAUSLAND.

* A paper by Mr. Frank H. McCausland at the Convention of Master Painters at Hamilton, July 26.

It is usual now to establish the refrigerator on the ground floor not far from the kitchen. As long as there is sufficient ice, food will keep even in a warm place. But it must be remembered that the ice will not. The size of the ice bill varies inversely as the distance of the ice-box from warmth.

A distinctly new line has been taken in engineering organization by the authorities who are conducting the operations on the U.S. Panama Canal. There is no doubt that a condition of affairs approaching actual insubordination has been prevailing among the employes, more especially among the large number of young engineers and artizans who have been attracted to the spot from the United States ; and who, in the words of a writer in the (U.S.) *Engineering Record*, "did not find any of the famed luxuries of tropical life waiting for their enjoyment." They discovered, on the other hand, that the conditions of their position imposed on them long stretches of arduous labor, without the opportunity of any relief from those relaxations or amusements to which they had been accustomed. Many in consequence abandoned an employment carried on under such forbidding circumstances and returned to their own country, where the accounts they delivered of their experience were not of a nature to encourage the advent of new adventurers to fill their place. The Panama Canal Commission have, therefore, given their serious consideration to the maintenance of a steady supply of supervision and labour, and to that end have appointed what they term a "Welfare" specialist, whose duty it will be to devise means and opportunities for the amusement and recreation of the hands engaged on the canal. The step seems to be a judicious one ; and the work in tactful and sympathetic hands should do much to develop and maintain that morale which is an absolute necessity to the success of an undertaking so formidable to life and habits as the construction of a huge waterway across the miasmatic isthmus of Panama.—*The Engineering Supplement*.

In New York City it is said that the craze for erecting apartment buildings in the various grades is subsiding. Instead there is a revival of the erection of individual dwellings. So far this year there have been filed with the bureau of buildings plans for dwellings aggregating a greater financial outlay than all the dwelling plans filed in 1904. An examination of the building records shows that the turning point from dwellings to apartment houses came in 1899, and steadily increased up to and including 1903, remaining stationary in 1904, and decreasing in favor of dwellings again in the current year. Through July first plans had been filed in Manhattan for dwellings worth more than $3,000,000, which exceeded by $1,000,000 the total values of dwelling plans filed in 1904. Real estate men began to notice the change last fall. Persons of wealth who had closed their homes and caught the family hotel idea began to reopen their dwellings, and families returning from country places took up the same movement, which has been gaining strength ever since. Builders now are becoming wary of farther apartment hotel operations, and even the construction of flat houses is going on more slowly. It is the opinion of many interested in investments that the apartment house; except it be of exceptional worth and large size, is something of a delusion and a snare. The deadly parallel is being drawn upon buildings which were erected several years ago with an alluring array of figures drawn in advance of their completion as to their possibilities and probabilities of earnings.

Who of us has not, at one time or another, seen the effect of a harmonious color scheme ruined by the introduction of violent contrasts and jarring tones and shades? The following notice, which was affixed at the entrance of an exhibition of modern paintings in Germany recently, has been quoted by a contemporary in a humorous vein. Does it not, however, mark a decided step in the right direction.

TAKE NOTICE!

In order that the effect of the pictures may not be totally lost, or at least partially impaired, by the loud and glaring colors of ladies' dresses, the managers have decided to issue the following regulations :—

"The galleries are only open to visitors dressed in white, black, or violet. Grey has the privilege of being admitted at a reduced entrance fee. Violet is admitted free of charge Persons wearing the nationa costumes are refused admission."

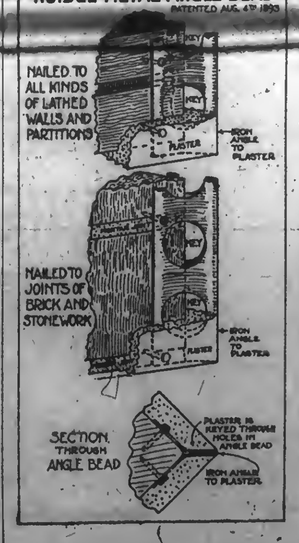
"The public are requested to observe the above rules in the interests of art and artists, be particular to appear in violet.—THE MANAGERS"

The Cabinet Maker and House Furnisher.

The general character of a small town in Ontario is very pleasing. The trees are generally well grown now and there are plenty of them. The introduction of granolithic sidewalks to take the place of the old wooden walks is a great improvement, giving an appearance of neatness and solidity that the wood never did. The small houses are satisfactory. It is the more ambitious people who get Shoppell's or some one else's cheap houses who work against the beauty of the town.

While the general death rate of New York has gone down 25 per cent. in the [illegible] diseases on the increase. Acute respiratory diseases [illegible] that a "Puenmonia Commission" has been appointed to find out the cause which it is generally suspected is bad air in street cars and office buildings.

There are yet many openings in Canada for manufacturing industries whose raw material is timber. A gentleman was recently in Toronto exploiting the market for wooden columns, although he was already aware that there existed in this country no small demand for these goods. He represented an American firm which had been importing Canadian lumber and consequently paying a duty thereon of two dollars per thousand feet, manufacturing the lumber into columns, and shipping some of the columns into Canada, subject, of course, to a duty of twenty-five per cent. These columns are made largely from clear pine costing sometimes as much as one hundred dollars per thousand feet. Recognizing the advantages which a home factory would possess in supplying the Canadian trade, this gentleman was looking around for a suitable location. The duties on the lumber and the finished article alone represent a very acceptable profit, not to speak of the increased business which would likely be thus secured.


HOIDGE METAL ANGLE BEAD
PATENTED AUG. 4TH 1903
NAILED TO ALL KINDS OF LATHED WALLS AND PARTITIONS
PLASTER
IRON ANGLE TO PLASTER
NAILED TO JOINTS OF BRICK AND STONEWORK
SECTION THROUGH ANGLE BEAD
PLASTER IS KEYED THROUGH HOLES IN ANGLE BEAD

HOIDGE

Metal Angle Corner Bead

Is Unsurpassed for Protection of Plastered Corners in all Kinds of Buildings. It is Universally Known as "THE PERFECT CORNER."

1—It makes a straight and true corner.
2—Broken and chipped off corners are unknown, when **"Hoidge Metal Angle Corner Bead"** is used.
3—The entire piece is imbedded in the plaster, giving a guide to plasterer.
4—It makes a corner which cannot be damaged.
5—Has a double continuous bearing.
6—Can be arched to fit any radius.
7—**The cost is nominal** owing to what the "Corner Bead" saves.
8—Many thousands of feet are now in use all over the Dominion.
9—**INVENTED AND PATENTED BY A CANADIAN.**

Made in Canada By

The Vokes Hardware Co.,
LIMITED
111 and 113 Yonge Street, TORONTO

Write us for price and further particulars

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited

Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	S. G. CURRY,	,,
2ND VICE-PRESIDENT	W. A. LANGTON,	,,
TREASURER	HENRY SIMPSON,	,,
REGISTRAR	W. R. GREGG, 96 King St.,	Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN GEMMELL	,,
J. WILSON GRAY	,,
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. E. VANIER, Montreal
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal
2ND VICE-PRESIDENT	E. P. TAYLOR, Montreal
SECRETARY	J. E. VANIER, Montreal
TREASURER	D. R. BROWN.

P.Q.A.A. COUNCIL.

JOS. VENNE	Montreal.
H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DUTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, Jr.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNEY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 471 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.
E. A. CARTER, Secretary.
H.A. BELL, Treasurer.
T. BRADBURY.
C. P. SHINDLER
K. M. FRASER
E. G. BAYNE
D. BAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS.

G. W. MURRAY, President. A. E. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President. T.D. ROBINSON, Treasurer.
G BURBEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: T. G. Latimer, E. Case, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Giroir.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAHER, Hon. Treasurer.
J. HERBERT LAUER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY,
GEO. H. HOOD.
Past Presidents

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTOIS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, Jr., 2nd Vice-President.
ALCIDE CHAUS'E Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONPONT.
ELZ. COTE.
LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

PERSONAL.

Mr. Paul M. Clemens, architect, of Winnipeg, was married recently to Miss Laufey G. Goodman, of Winnipeg.

Mr. A. Knieling, architect, who was formerly with Messrs. Parr & Fee, Vancouver, has recently started business for himself in that city. Mr. Knieling is German by birth, and it was in the Fatherland that he studied architecture. Coming to New York he pursued his profession there for a short time, prior to his arrival in the Terminal City, where he has been for the past three years. His offices are located in the Molsons Bank Building, Vancouver.

DIED on August 31st, at Dublin, Ireland, Margaret Ann, wife of David B. Dick of Toronto.

The Don Valley Brick Works

Manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

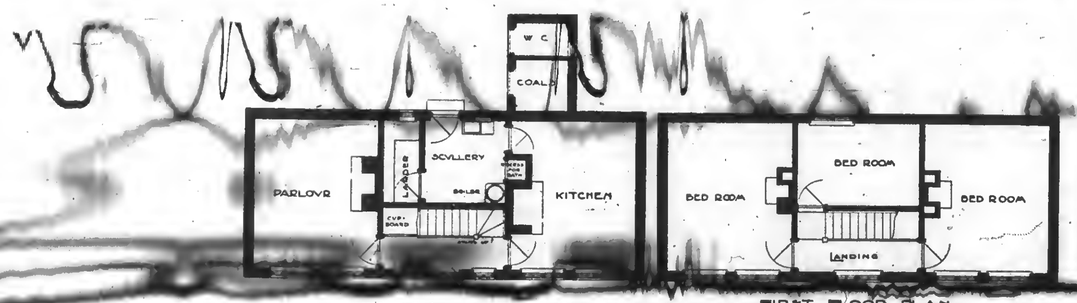
in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

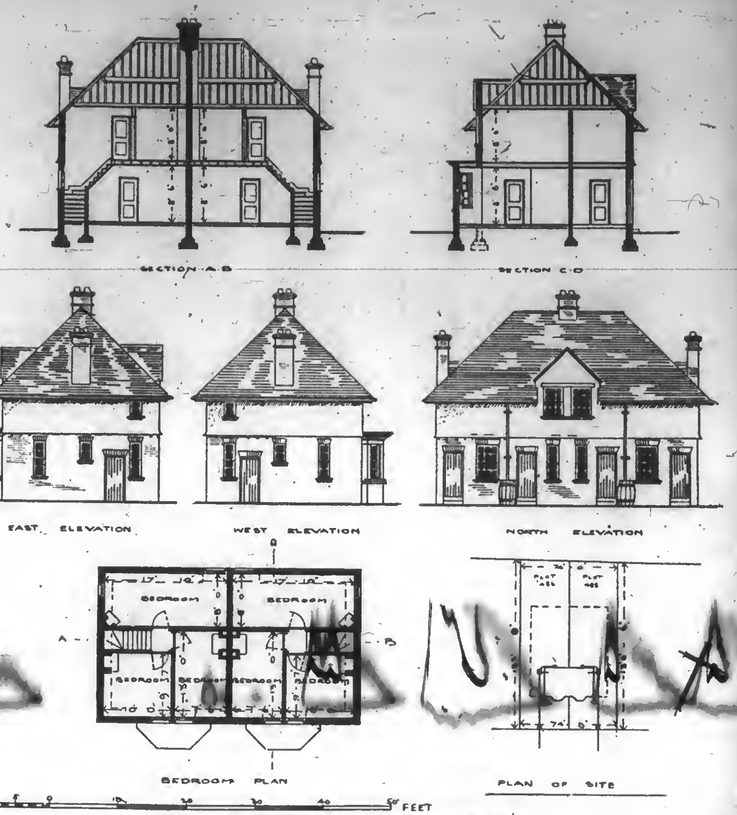
No. 500 Wilbrod Street, Ottawa. The Drawing Room.
Mr. J. P. H. Watts, R.C.A., Architect.



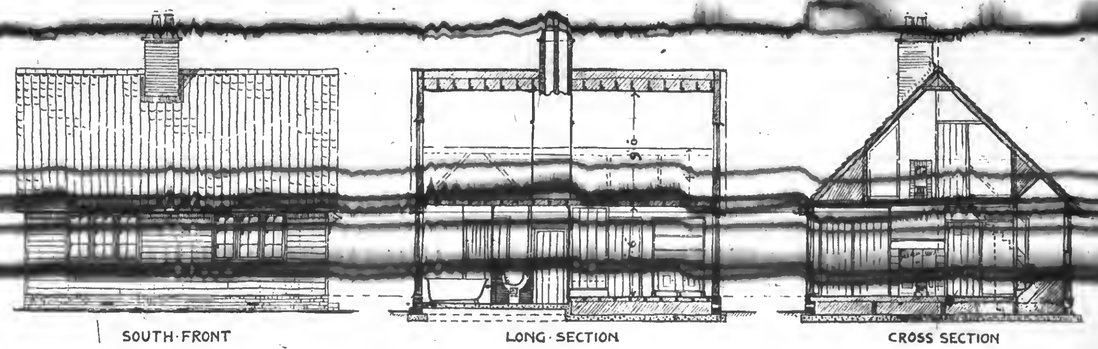
GROUND FLOOR PLAN FIRST FLOOR PLAN

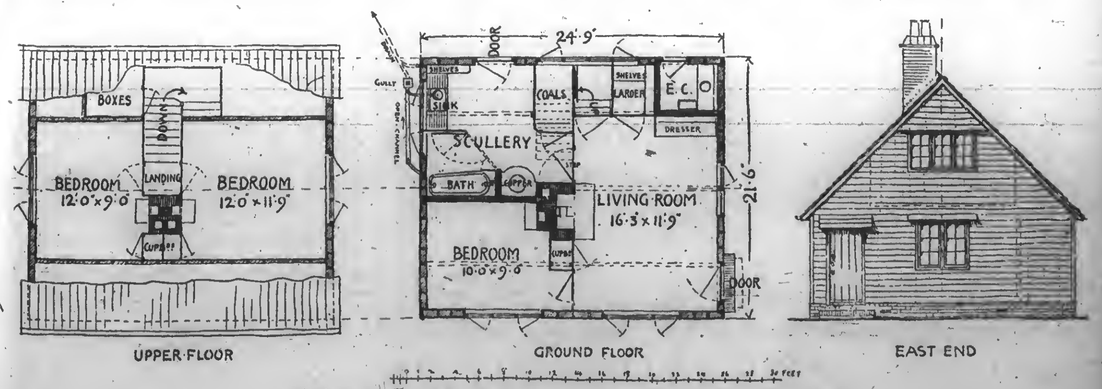
—Cottage built of Concrete Blocks by the Concrete Machinery Company, Limited, 18, Water Street, Liverpool. Architect, Mr. Gilbert Fraser, A.R.I.B.A., 67, Lord Street, Liverpool.

View of Mr. Troup's Cottage, as executed.

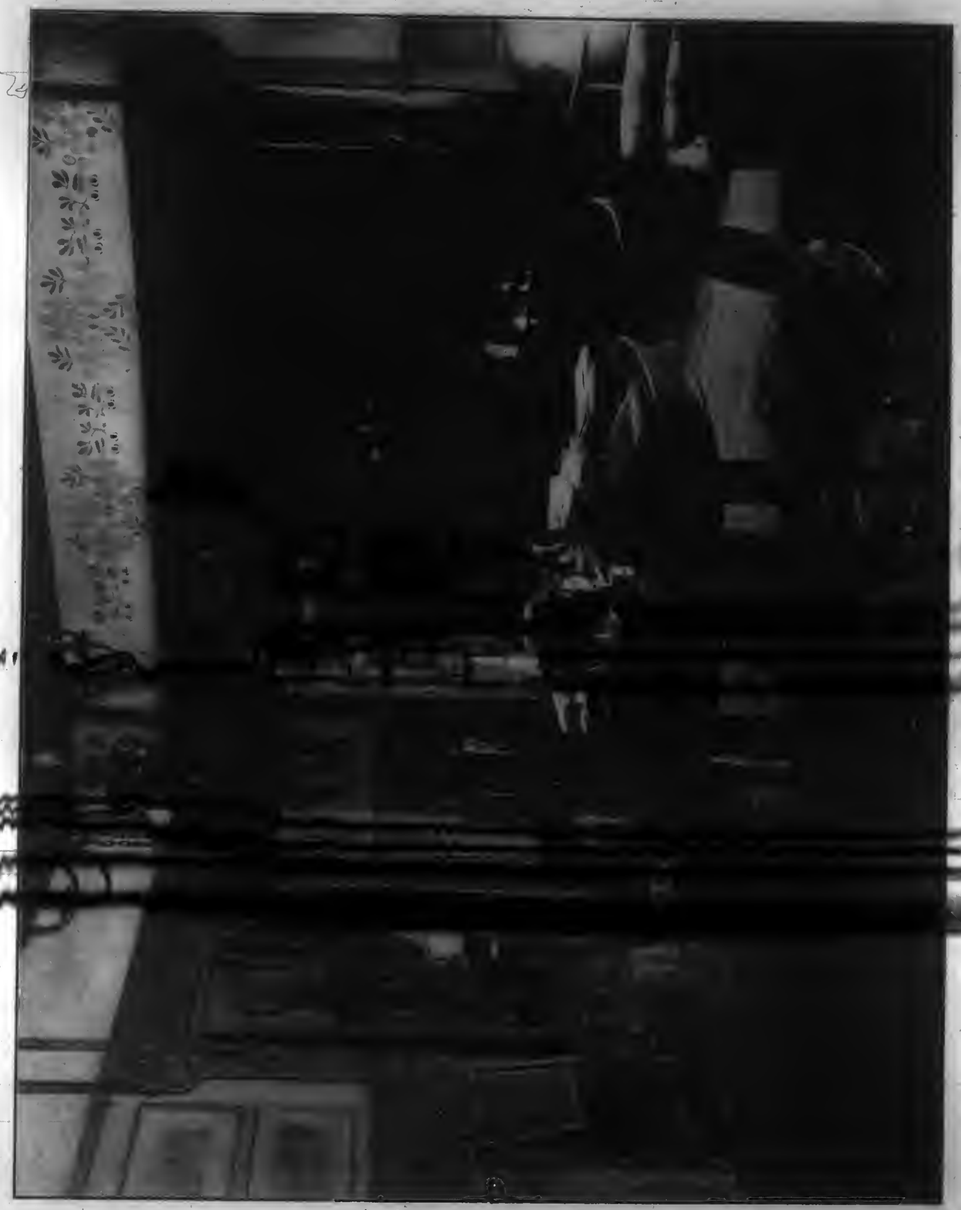


—Pair of Cottages by Mr. H. Cayley, A.R.I.B.A., Bank Chambers, Rothwell, Kettering.





—Cottage by Mr. F. W. Troup, Architect, 14, Gray's Inn Square, W.C.



No. 500 WILBROD STREET, OTTAWA. THE LIBRARY.
MR. J. W. WATTS, R.C.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1905

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 214. OCTOBER, 1905.

ILLUSTRATIONS ON SHEETS.

Golf Club, Winnipeg.—Messrs. Darling & Pearson, Architects.
Public Library, Sarnia.—Mr. M. R. Burrowes, Architect.—Plans.
Cheap Cottage Exhibition at Garden City.—Mr. Percy Houfton's Prize Design. Mr. Baillie Scott's Design.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Public Library, Sarnia.—Mr. M. R. Burrowes, Architect. View of Building.
Wall Decoration in the Royal Bank, Vancouver, by Mr. James Blomfield.

CONTENTS

Editorial	145	Our Sinful Extravagance	158-159
Canadian Architect and Builder Competition for Students	146	Bad Gas Fitting	ii
Toronto Chapter O.A.A.	146	The Inclined Railway	iii
Ornamental Trolley Poles	147	Building Collapse	iii
Speculative Brickwork	148	The Suburban Home	iii
Our Illustrations	149	Plumbers' Apprentices	iv
Review	150	To War on Race Suicide Landlords	iv
Plastering in Winter	151-152	Heating and Dust	ix-x
Chicago Foundations	153-154	Babies Wanted in these Flats	xi
Intercommunication	155-156	Canadian Tin Plate	xi
Montreal Notes	157	Pulp Refuse as Fuel	xi
The Sketch Club, P. Q. A.A.	157	Architecture of Concrete Building	xii-xiii
Bachelor of Architecture Course at McGill University	158	The Street Traffic in London	xiv
Architectural Classes	158	Trees and Lightning	xv
		Disinfection with Chloride of Lime	xv

Drying Plaster in Winter.

The excellent article from the *Engineering Record*, reprinted on another page, suggests that the winter, so far from being a bad time to dry plaster, is, if the proper arrangements are made, a very good time for the purpose. The arrangements are:—a house which has the heating apparatus installed before plastering and is kept [illegible] kept open enough to admit and expel air constantly, without lowering the general temperature of the house. [illegible] proportion to its warmth, we have an ideal condition—the continual admission of cold air, empty of moisture, to take up moisture continually as it grows warmer and more eager for it, until at last when it is at its warmest and fullest, being also at its lightest, it is shoved out of the openings at the top by more cold air coming in to repeat the process. The air of summer, which comes and goes substantially at the same temperature, cannot be more effective, for drying purposes, than this.

The Brig of Ayr.

The Auld Brig of Ayr is in danger, in fact it only preserves its form because the town council have built a centring under it pending decision as to whether it is to be taken down and rebuilt or is to be replaced by a modern bridge. One of the great English building firms, Sir Douglas Fox and Partners, have been consulted and report that there can be no question of taking down and rebuilding stone for stone, because so many stones are cracked and broken that the new structure would be to a great extent a new bridge. Its aged appearance would disappear; its wrinkles and furrows, its distorted arch, its weather-worn arrises would be corrected, and all its history and associations would be lost. Sentiment would not be served by that course and the town of Ayr might [illegible] motive of beauty and have another kind of bridge. But it is not necessary to do this or to take the bridge down at all. Thanks to a grouting machine, invented by the late [illegible], many ancient historical buildings which were cracked from top to bottom have been repaired, and are to-day stronger and firmer than they have ever been. By means of the grouting machine, liquid cement can be blown by compressed air into the heart of any wall, no matter of what thickness, whether the crack is wide or as narrow as a sheet of cardboard. And this treatment, the report considered, would meet the case of the Brig of Ayr. Decision was reserved.

House Mottoes

There are indications in our exchanges of the approach of a fashion for mottoes and inscriptions as a form of decoration for houses. Unfortunately the tendency of the fashion seems to be not only to use mottoes but to use the same mottoes. Certain mottoes are said to be appropriate for certain rooms and lists are given. That certain mottoes are suitable for certain rooms must be true; at any rate we can perceive that certain mottoes are not suitable for

certain rooms. But an ordinary mind rebels against too much concentration of mood in rooms. We do not as a matter of fact get into moods much now-a-days. Our fore-fathers felt the moods genuinely; they were more child-like than we are, and mottoes taken from their writings ring false now-a-days if applied to ourselves. There is not much revelry in dining-rooms now. We are sober even in our eating and never get properly drunk at all. Our dining-rooms are places where we talk, and incidentally are fed. Our libraries are working places for those who use books and smoking places for those who do not. None but a prig would inscribe a library with sentimental and vain-glorious exclamations about his love for books in themselves. It is the end for which a man uses his books that will furnish the mottoes that inspire or sustain him; mottoes which he likes to have before his eyes. In a general way the proper mottoes for decoration are those which people select for themselves and it is to be feared that the best of these will never be put up. It is the exceptional person who can express himself truly, so as to meet the eyes of other people but without regard to them in his mind.

Made in Berlin.

A really remarkable exhibition called the "Made in Berlin Exhibition" has been held during the current month at Berlin, Ont. It consists entirely of articles manufactured in the town, and the variety, for a town of 11,000 inhabitants, is surprising. Sixty-five varieties of manufacture are estimated. Doubtless some of them are varieties made by the same house. But a rough list, made at the exhibition, is striking. Leather and furniture come foremost, the two original industries. The sole leather now reaches England, and there is a furniture house that turns out designs as good as anything imported from the Michigan factories. Then there are office and shop fittings, pivoted bins, wooden ware, brooms, felted boots and shoes, rubber goods, buttons of all kinds, machinery of several kinds, gasoline engines, water motors, boilers, furnaces, pumps, automobiles, and bicycles, refrigerators, pianos, mattresses, trunks and leather articles, clocks, electric meters, suspenders, furs, boots, clothing of several kinds, besides beet sugar, beer, cigars, confectionery, biscuits &c. With all this industry, the general impression made by the town upon a [illegible] pleasant place to live in than of a manufacturing town. It is a town of neat houses on good streets that are well kept, boulevarded generally, with granolithic sidewalks and an abundance, perhaps an over abundance, of trees. Every house, no matter how small, has ground about it; the large houses have extensive lawns, usually concealed from the street only by the number of trees which surround them. Chimneys are not a feature of the town. Instead there are the towers of several large churches. And the country about is beautiful. As a typical Canadian manufacturing town, the place is one of which Canadians may be proud. How much of its prosperity is due to the industrious German character of its inhabitants, how much to the accident of its position in the midst of a fertile agricultural country, one cannot say. Both conditions, no doubt, contribute, and, as both industry and fertility are common qualities in this country, Berlin may be taken as a type of what a Canadian manufacturing town may be made.

CANADIAN ARCHITECT AND BUILDER COMPETITION FOR STUDENTS.

A HOUSE OF SMALL COST IN COUNTRY TOWN.

The small house is a fertile and a useful theme for study in this country. That it is susceptible of many solutions is shown by the variety of designs recently furnished in England for a cottage of a given number of living rooms and bedrooms. These designs are suggestive of the sort of thing required for the small houses of a country town here but they require adaptation and some expansion. It is this adaptation and expansion that is proposed as the subject of this competition. It is not however an expansion of the plans, reprinted in this and the last two numbers of the CANADIAN ARCHITECT AND BUILDER, that is required so much as an expansion of the theme—a six-roomed house. That is the problem in both cases, but the English cottage is intended for an agricultural labourer, ours is intended for a mechanic, and the cost should be about $1500, or twice that proposed for the English cottage. It must be borne in mind, however, that English prices are not our prices, and that the exhibition cottages are all said to be over the proposed cost, except when erected, as they were for this exhibition, at cost price.

It is proposed to place the six-roomed cottage for this competition on a lot of 40 ft. frontage by 100 ft. depth, situated on the west side of a north and south road. The house will be supplied with water and have sewer connection.

The drawings required are: The two floor plans; elevations of the front, rear and one end; a perspective view, showing the front and that end which is not shown in elevation.

The drawings are to be arranged neatly on one sheet having the proportions of 2 to 1. The scale is to be not merely noted but drawn. A brief description of material used is to accompany the drawing.

Both drawing and description are to be marked by a cipher or nomme de plume. The author's name is to be enclosed in a sealed envelope similarly marked. The three communications—drawing, description, and sealed envelope—are to be parcelled together and one cover marked "Drawing for Canadian Architect and Builder Competition," and sent to the C. H. Mortimer Publishing Company, Confederation [illegible] Toronto, not later than 1st, 1900.

Judgment of the sketches will be made by a committee composed of members of the Ontario Association of Architects and of the Eighteen Club of Toronto. The following prizes are offered: First, $15; second, $5; third, one year's subscription to the CANADIAN ARCHITECT AND BUILDER, Architects' Edition.

The CANADIAN ARCHITECT AND BUILDER is to have the right to reproduce any or all of the drawings.

TORONTO CHAPTER, O.A.A.

The regular Tuesday luncheon of the Toronto Chapter of the Ontario Association of Architects, started again, after the long vacation, on the 3rd October. At the first luncheon a committee was appointed to wait on the Board of Control in reference to the conditions of competition for the new public library. As a result of this committee's work, the preliminary draft of the conditions has been referred back and it is to be hoped that more acceptable conditions will be prepared.

ORNAMENTAL TROLLEY POLES.

Many experiences of the vulgarity of standard objects of utility, which are made ornamental, makes one receive without much enthusiasm an announcement that American ornamental trolley poles have come into the market.

The best ornament for utilitarian objects is the ornament of a meek and quiet spirit; and, when the object is a trolley pole, the primary beauty is most emphatically the grace of uprightness. Overhead

THE DISAPPEARANCE OF THE VERTICAL LINE IN CITIES, AS SEEN BY HARRY FURNISS.
(From the Windsor Magazine.)

wires of any kind are an injury to civic beauty and the ultimate aim must be to get rid of them; but their evil influence is much mitigated if the poles which carry them are plumb. This is all that is required of double [illegible] purpose requires no excrescence of any [illegible] and there is therefore no occasion for ornament. Single poles, which have an arm on either side or on both, are susceptible of improvement by care in their structural design. There is a junction to be redeemed from crudeness, and proportion to be observed between the vertical member and the arms; also the arms have ends which want emphasis, and, being the ends of a tube, would, for the sake of wearing well, be the better for a cap. At or near this point must be a hold for the wire. That is the sum total of the motives for structural design, and, if they are all satisfied in a [illegible] to be, the necessity is met with the least possible offence from the means.

Is it possible to go further and make the poles beautiful by adding ornament? A wrought iron bracket is at once suggested, and the designer of the American ornamental poles is not behind hand. The description of these poles reads: "Under the arm projecting from the top to support the trolley wire, extending from the pole to the end of the arm, is placed an ornamental bracket of scroll work or other design."

It is extremely doubtful whether, even if properly applied, scroll work of one design, executed mechanically and repeated without variation, would prove to be a source of much pleasure. But this application—the only application we are likely to get in the case of trolley poles—reveals its lifelessness in the word "under." The brackets are to go under the arm. The arm will have a separate identity, and we may leave it to the electric railroads' engineer to make sure that it does not depend upon the bracket for support. The bracket will in fact depend from the arm. And the liberal effort of the railroad company to be beautiful will meet with indifference which, if anyone thinks about it at all, will perhaps seem unaccounted for. Old work of the kind, in the old world, interests them; and this does not. Is it because it is new? Not entirely. Age is an advantage, even to ironwork—in the slight irregularities that come from various causes. But there is more than this. Old work had slight irregularities to begin with, because it was made by hand instead of mechanically, and by eye instead of on a pattern block. For this reason alone no two objects of a kind would be exactly alike, even if of the same pattern. But as there would be little to be gained by following the same pattern exactly, and much to be gained (for the workman as well as for the spectator) in varying the pattern, there would probably be no two exactly alike in design, and the interest would be far greater than when the same design is turned out by the hundred because done mechanically. The chief reason, however, is that the

FROM A SKETCH BY T. F. LAIST, AMERICAN ARCHITECT TRAVELLING SCHOLAR.

old design was constructional. The bracket was not an ornamental addition to the arm, it was itself the arm. The top member was little if any thicker than the rest of the bracket. The scroll work was simply a method of making a strong arm out of weak material. It is constructional iron work; a small truss. This, recognized instinctively by the general public and consciously by persons experienced in design, is the bottom [illegible] old wrought iron work of the kind is interesting, and why a stout cast iron tube, decorated [illegible] work will be a travesty, and its foolishness will be felt even by those who do not know wherein it is foolish.

A further question arises:—whether, if the railroad company were zealous enough about beauty to have all its trolley-arms made of true scroll-work; wrought by hand, and of design varied as the fancy of the workman directed him; whether, in that case, complete satisfaction would be reached. Hardly, for here comes in another point of difference between us and earlier days. This was the mediaeval workman's natural way of accomplishing the end. He worked with small bars of wrought iron; we cast and roll iron of any shape and size; and the obvious way of making a trolley-arm now is to cast a pipe of sufficient diameter and fit it into a socket on the vertical post. This is the basis of the modern designer's problem. If it is of no avail to make it beautiful by tacking the beautiful mediaeval structure underneath, it is equally a sham, though more difficult to recognize as a source of failure, to make a true design in the mediaeval manner. Assuming the work to be equally well designed and

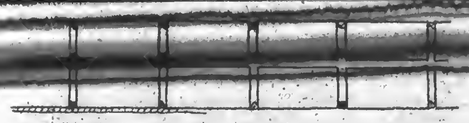
wrought, it must still be beautiful; but it has ceased to be fitting. For strong practical work, many times repeated, cast iron is the natural modern material, and, though the wrought iron scroll-work arm may be true Gothic design, the man who does the work well in cast iron is the true Gothic designer. In carrying out his work with the severe simplicity that the occasion demands he is not out of spirit with the old workmen; who were not always florid, but gave us also the plain wall spaces and simple constructions that we envy; and who, most likely, if they had been called upon to erect several thousand trolley-arms in one city, would not have tried so hard as we think to direct attention to them.

SPECULATIVE BRICKWORK.

It is accepted as a general truth in Ontario, particularly in the country, that a brick house is a cold house. This seems a strange conclusion to have arrived at about a good building material, but it is unfortunately true. That it is necessarily true is quite another affair: It is altogether a matter of the wretched habits of building we have got into in this country. The fault lies not in the brick but in the way in which it is laid. To save some mortar, but chiefly to have time, we build brick walls that as far as the wind is concerned, are little better than a sieve.

The householder when he contemplates his dwelling wonders how the cold air finds its way in. The brick it is true is not absolutely impervious to air but the mortar is as closely set as stone; and, when mortar fills the space under and over and between all bricks, it is a mystery how a brick wall lets in the cold. What air there is in the bricks must be immovable and ought to act as a protection, wrapping [illegible] all round with the same non-conducting envelope [illegible] keeps a bird warm when it fluffs out its feathers.

The trouble is that the vertical joints are not full of mortar, as we assume that they are, but are open channels throughout the greater part of their length, stopped only at the outside and inside ends, and that only by an irregular plug of mortar that does not necessarily fit tight.



Inside.

The proper way to lay a brick wall—nine inches thick or otherwise, but the nine inch wall for cheap houses is the subject of our discourse—the right way of building it, as generally understood, is to lay a course at a time; to finish the stretcher course as completely as the heading course, laying both halves of it at once, on a bed of mortar which extends the full thickness of the wall; and by sliding the bricks forwards and sideways as they are placed on the bed, some of the mortar, which is laid on thick for the purpose, is squeezed up to fill the vertical joints, both those running across the wall and that running lengthwise. This fills the bottom half of the joints. The top half is filled by throwing mortar into them when the next bed of mortar is spread. Thus all joints are full of mortar, and the wall is both strong and air-tight.

The speculative builder's method differs from this fundamentally in that he builds up the inner and outer portions of his stretcher courses separately. The use of coloured mortar for the face of the wall has no doubt given rise to the practice, but the particular result is an entire absence of mortar in the longitudinal joint all the way up, crossed and stopped only by the headers and the bed on top of them every sixth course. For the five courses between headers he builds separately two neat little four inch walls. It is a size convenient for keeping control of your mortar, and he makes it go as far as possible. The bed is made abundantly thick by the simple process of pressing down the centre with the point of his trowel and squeezing the mortar out at the edges. (The bed being thus hollow in the centre, the brick rests only on its edges, which gives it every chance to spall; but that is another question, and perhaps not a serious question in the case of a small house.) The mortar which bulges out at the edge of the bed, when a brick is set down upon it, he scrapes off handily with the point of his trowel and with it butters the end of the next brick, making an irregular blob of mortar on its outer edge—the plug on the outside, shown in the cut above. Some bricklayers have a particularly irritating way of catching up on their trowel any remnants of mortar they can, and then, as they call it, "cleaning" their trowel by scraping these savings off on the top edges of the brick as they lie on the bed, and carefully smearing the scrapings over the top of the joints, making a thin protective coat which will effectually prevent any mortar falling in when the next bed is thrown on top of the course.

So much for the method. The result is a wall with vertical joints empty of mortar, except for a plug at the wall faces which, neatly pointed, makes a good showing, giving the impression of fullness of mortar to a wall which is as empty of it as it can possibly be without falling down.

And the result of this emptiness is that a candle has been—not can be, but has been—blown out when held on the inside of the windward wall of a house which was closed in but not back plastered.

The back-plastering is usually considered to be the cure for the spirit of draught, but it is not enough. Double back-plastering would be better, and that is the suggestion offered by the writer to any one who is caught, as he was, by an agreement for a house intended to be cheap, in which it would have been obviously unfair to force perfection upon the builder. The contractor for the mason work, who was anxious to do what he could, short of making his men work in an unaccustomed manner, so that they would be slower than he had calculated upon, himself proposed, as a solution, to back plaster the outside half of each division of wall before laying up the inner half. This has been done (as shown on the left of the plan above), and it looks so solid that the suggestion is here offered for the improvement of speculative brickwork at small cost of material or time.

In the budget recently brought down in the Canadian House of Commons provision was made for increasing duty on white lead from 5 per cent. to 30 per cent. This was done to afford protection to the new white lead industry established in Montreal, the first of its kind in Canada. As a result it is announced that the price of paint will advance about 75 cents per hundred. It is expected that the result of increased duty eventually will be that white lead will be wholly manufactured in Canada instead of being imported and ground into oil here, as at present.

OUR ILLUSTRATIONS.

GOLF CLUB, WINNIPEG, MAN.—MESSRS. DARLING AND PEARSON, ARCHITECTS.

The plan of this Club-house, which is shown in our illustration, requires the further explanation that the men's locker-room is in the basement of the wing which contains the smoking and reading rooms, and the club bedrooms are in the upper floor of this wing. There is a direct entrance from outside to the locker-room by way of the professional's shed. The communication with the house appears to be by a stair which lands at the ladies entrance; but this, and the contracted ladies' quarters appear to be a temporary expedient. An open newel main staircase extending from the locker-room to the bedrooms is shown on the original plan, (which is we understand to be carried out). The ladies' room here shown becomes a card room; the ladies having proper quarters in a splayed wing on the other side of the entrance hall, of which the main motive is a ball-room, in connection with which are the ladies' sitting room and lavatory and a private stair leading to their locker-room below. It is this private communication within separated parts, so that there is no interweaving of the passage way of one part with the passage way of another part, which is so essential in all club plans, but especially in a club for sport of any kind in which both men and women share. In the perfect plan of this club-house the main stair is entirely enclosed, by doors, both from the entrance hall and from the service department. It is, as far as members are concerned, always a stairway for men only; and as far as service is concerned it belongs only to men during the hour of descending in pyjamas to the showers and until such an hour as those who are staying in the house have gone to their work, when the women servants can ascend to "do" the rooms. This convenience is somewhat disturbed by the present derangement. Even in the early morning when there are no women members about there should be women servants cleaning the hall who will make it a zone unsuited for the companions of the bath; a temperate zone where tropical vesture is out of place.

PUBLIC LIBRARY, SARNIA, ONT.—MR. [illegible] HORWOOD, ARCHITECT.

[illegible] to the scale of the requirements of a public library in a small town. There is evidently open access to the stacks so that the position of the librarian's private room and of the board room, while retired, is not inaccessible. The general reading room and the children's room are under the eye of the attendant at the delivery desk, but students are given a more complete seclusion. The smoking room in the basement is an application of the doctrine that the public library is the proper alternative for the saloon. A village Johnson would soon make it the more popular resort of the two, gathering around him an evening circle, as the great talkers did in the days when the coffee house flourished in London. The space under the stack room is a filing room which, from the length of the approach, is evidently not considered an active department at present. When, however, the extension is built, and the projection for the librarian's office may also be extended without ceasing to be subordinate to the stack room wing, a stair inserted there would add greatly to the usefulness of the filing room not only for filing but for other kinds of work.

In external appearance it will be seen that the building owes much to its dome, and that, though simple, it takes its place among the neighbouring buildings as a monument of decided dignity. There is a skylight, 6 feet in diameter at the top of the dome which the example of the Pantheon at Rome shows to be the effective spot. This skylight admits light to the rotunda through a ceiling light which is twice the diameter—that is to say four times the area—of the opening in the dome.

DECORATION IN VANCOUVER BRANCH OF THE ROYAL BANK OF CANADA, BY MR. JAMES BLOMFIELD, VANCOUVER.

These wall paintings have an allegorical reference to Vancouver and the Royal Bank. Vancouver Triumphans represents the rising of the City of Vancouver with Industry on one side and Agriculture on the other. The figure in the lower panel is a personification of Acadia, representing the Maritime Provinces in which the Royal Bank had its origin. The coats of arms inserted in the frame round Acadia are those of the Crown, New Brunswick, Nova Scotia and, (at the bottom) the City of Halifax, which is the parent city of the Bank.

CHEAP COTTAGES—MR. PERCY B. HOUFTON'S DESIGN.

The decision in the cheap cottage exhibition at Garden City, Hertfordshire, gives the first prize for the £150 cottage to Percy Houfton, whose design we reproduce, with this view, of the cottage as executed, taken from the *County Gentleman*.

The material of the walls is 9" brickwork, ronghcast in cement. The roof is of local red tiles. The living room is floored with stone quarries in cement; the rest of the floor with granolithic cement. All on a 6" bed of concrete. There is water snpply from mains. The inclusion of the coal place, w.c., and open lobby within the rectangle of the ground plan provides more space on the bedroom floor. The larder ought to have opened opposite to the stair, not from the scullery. The The small bedroom as easily as that next to it might have had a fireplace. The offer is made to duplicate this cottage (in England) for £175, ($850), including pro-

fit, architect's fees, and men's travelling expenses. 3½ per cent. could be saved by erecting two together; 5 per cent by erecting four.

MR. BAILLIE SCOTT'S DESIGN.

Mr. Baillie Scott has produced what is called in some of the illustrations a "new-old" cottage. This design is an entry for Class 4, a pair of cottages at £35 a room. There is no assertion made that he has fulfilled the conditions. In a confession of faith, printed in an introductory portion of the catalogue of the Exhibition, he says "the question of money, however important, should always be a secondary matter to the earnest attempt to achieve that combination of the ideal and real which makes building as an art unique. The cottage should be a dream come true, the result of infinite pains, and whether it pays 5 per cent. or 6 per cent. is quite a secondary matter." So we may assume that, although it is entered under the class costing £35 a room, whether it will actually cost only that much or whether it will cost more is a question the consideration of which has not received infinite pains from the designer. However there is no question about his capacity for dreaming and we may consider it for its value in point of taste and character. "All buildings," he says, "even the smallest, have personalities, and the cottage should have a soul of its own." In some respects this is a case of metempsychosis. It is a twentieth century cottage inhabited by a seventeenth century soul.

The living room is 12′ × 20′ × 7′ 6″ high; the parlour 9′ × 12′; scullery 9′ × 12′. The bedrooms are 8′ high, and are respectively 12′ × 13′, 7′ × 11′, and 9′ × 12′. It is complained that the windows are too high; that cottagers confined to bed [illegible] could not enjoy the pleasure of looking out of the window.

The material is brick, roughcast, with oak half timber wall. The floors are paved with red brick on the ground floor. The entrance court is paved in patterns of cobble stones.

REVIEW.

NATURAL VENTILATION. PUBLISHED BY THE NATIONAL VENTILATING COMPANY, 1 MADISON AVE, NEW YORK.—We have received a booklet which, though intended to be an advertising medium, to [illegible] devices of the [illegible] company, [illegible] this column as the devices it advertises are designed to effect ventilation in the way in which in the opinion of experts is the only proper way;—that is by giving opportunity to the natural property of air to keep itself pure by continual movement. The natural order of things in air, as in everything else in the world, is preserved by gravitation. The heavier air descending pushes up the light and the agency at the bottom of movement is heat. Very slight differences of warmth in a room are suffcient to effect the delicate balance of air; the difference between an outside wall and an inside wall, between a portion of the floor that has sunlight and the remainder that has none; and the furnace of the human body is the immediate agent in securing pure air for each successive breath, removing the exhaled air, partly because it is warmed itself and partly because the air surrounding the body is kept perpetually ascending by the warmth communicated to it in its contact with the body.

There is therefore provision made by Nature to remove exhaled air as soon as it is vitiated. In order to take advantage of this law for the ventilation of a room, it is obvious that there must be the means of removing the air from the room at once, in pursuance of the impulse upwards, without giving the vitiated air an opportunity to remain in the room until it is cooled, descends, and mingles with the purer air below so as to lower its quality.

This is what is aimed at by the contrivances of the National Ventilating Company, which are, briefly, metal boxes fixed on the bottom and top rails of windows for the entrance and extraction of air. The lower box consists of two parts, an outside hood in the form of a tunnel through which the wind can blow, with the result that as soon as it does so it closes a pivoted valve and air can only enter the room from the side opposite to the wind. This it is claimed not only prevents the violent entry of outside air but makes it enter pure, since all dust and other particles of impurity are carried past in the current of the wind and cannot return under the lee of the hood into the eddy from which air is drawn into the room. The inner member of the lower ventilating box is devised for two ends:—(1) To break up the columns of air by passing it through a coarse membrane, so that it enters the room in small separated columns and becomes mixed with the warm air of the room, thus preventing draughts. (2) To deflect the entering air upwards. This it is claimed involves a movement of the warm air of the room towards the window so that a seat near the window has not as its accompaniment a draught along the floor.

The upper ventilator is simpler. Invention in its case seems to have been devoted to procuring the ex[illegible] of the inner air without giving the out[illegible] occasion to [illegible]

The normal application of these appliances is to a glass panel inserted below the bottom rail and above the top rail. In case of their insertion in old work, the separation of the meeting rails which this would involve is made good by a specially devised weather strip.

We have given this book[illegible] the conviction that it is worth study. Artificial ventilation by the propulsion of air, does not receive favourable comment in the [illegible] of the British Hou[illegible] from other investigators. Artincial contrivances are apt to run counter to natural means, and, in the case of the movement of air, the natural means are so clear that any system that proposes to work in accordance with them commends itself.

Of course it is not true to say that natural means of ventilation cost nothing for their upkeep. Natural ventilation has as its basis the application of heat. The method under review implies a greater supply of heat, equivalent to the greater supply of fresh air, and the cost of the extra consumption of coal will be the cost of its maintenance. If any man does not want to pay for ventilation he must submit to vitiated air and pay for that daily by impaired vigour, ill health and even disease.

The new Canadian Bank of Commerce Building at Edmonton, an illustration of which appeared in the ARCHITECT AND BUILDER for September is constructed with Roman stone, manufactured by the Roman Stone Company, of Toronto.

PLASTERING IN WINTER.

The very severe weather which was experienced in this country the past winter, resulting in the practical cessation of building operations in nearly every section, serves to direct attention afresh to the difficulties which always attend the attempts to satisfactorily plaster a building when the temperature is at a low degree. In discussing the matter a writer in a recent issue of the *Engineering Record* points out how many of the defects noted in connection with plaster work done in winter may be remedied, as their causes seem be very little understood. He says:

Heretofore wall plaster has been a mixture of varying proportions of slaked lime, sand and hair, made at the building, usually out in the open with no protection from the elements. If cold weather came on the mixture would freeze and could not be used until thawed out, with consequent injury to the binding qualities of the material; or, as often happens, the frozen mixture is applied to the walls to soon come off as the frost thaws out. Then, too, the quality of lime used varies greatly in quality, and poor lime is cheap. Sand also differs greatly in quality, and sand that contains a large percentage of loam requires less time to bind it together; but loamy sand makes a very inferior plastering mortar. When lime of the best quality is obtained and good sharp sand is at hand, the proportions that enter into the mixture are uncertain and are guessed at by the laborer who does the mixing. This laborer is the unskilled workman of the job, and if he does not properly manufacture the mortar all the skill in the world in applying it to the wall by skilled workmen will avail little.

This unsatisfactory state of affairs in making plastering mortar has now been overcome, as many manufacturing plants have been established throughout the country which slake lime by machinery, dry the sand, card the hair, automatically weigh the proper proportions of each and mix the whole together thoroughly by machinery and deliver this mixture in a dry state to the building in suitable containers, usually jute bags. As the material so prepared requires only water to be added at the building to make it ready for use it does away with a great many of the disadvantages of the old way, and has the great advantage of insuring a uniform plastering mortar of every superior quality that is easily handled.

Plastering mortar prepared in this way can be taken into the building and mixed with water in water tight boxes on the floor where it is to be used and this avoids all chances of freezing if the building is properly h[illegible] it should be

SOME OF THE TROUBLES ENCOUNTERED.

In the treatment of some of the troubles encountered in plastering in winter, we will not consider those met with when plastering mortar is made at the building in the open in the old way, but will consider that if the mortar is made at the building it is properly protected so far as its manufacture is concerned. With this exception the following comments apply equally to all kinds of plastering mortar.

Plaster is necessarily applied in a wet state, and the surplus water has to evaporate or be dried out of it. It is this surplus water and other dampness in a new building that are the chief causes of trouble in winter plastering.

In winter, when the temperature is low, evaporation takes place slowly or not at all. In most cases the building is cold, is not inclosed, or possibly the windows have only muslin screens, but at any rate the conditions are usually bad for drying out the moisture from the plaster and from the other parts of the building. If very cold weather comes on the damp plaster freezes and then there is trouble.

The amount of dampness in a building is very much greater than is usually supposed. In frame structures there is moisture in pretty much everything that enters into it—the brick in the chimneys, the cement concrete in the cellar and bathrooms, even the lumber contains much moisture. In the larger brick or stone buildings with thick walls, concrete or tile floors the amount of moisture is very large. The greater part of this moisture will have to be dried out of the building sooner or later; but until this is done it is liable to be a source of trouble, and this is particularly the case in winter.

The methods used to get rid of this moisture are for the most part crude, and in many cases are the causes of greater trouble than the moisture itself. In hardening, the plaster of Paris and lime in wall plaster combine chemically with some of the water, either in the form of water of crystallization or in formation of hydrates. Therefore, all of the water added to wet the plaster does not have to dry out. The so called hard or patent plasters contain more or less plaster of Paris; they do not require so much water to be dried out as other plasters that do not contain plaster of Paris; in other words, they dry quicker. This chemical change or hydration takes place gradually, and it is not desirable to dry the plaster so quickly as to prevent its taking place properly. An overheated building is quite, if not more, injurious than an underheated one. The majority of builders regard the ideal drying conditions in winter to be an overheated, tightly closed building with no circulation. This is far from being right. Circulation of air is, if anything, more important than heat, if the outside atmosphere is above freezing. On such days as the atmosphere outside is very damp, and most it is better not to open the windows.

IDEAL CONDITIONS.

The ideal condition is to have a gentle heat to keep the atmosphere warm, and allow sufficient circulation of air to absorb and carry off the moisture. It is especially important that the heat should be kept up during the night. The proper way to accomplish this is to have the heating apparatus installed in a building and in working order before any plaster is applied. Temporary connections can be made, and heaters [illegible] the middle of the room. By doing this, and [illegible] the simple precaution of opening the windows from the top during the day time to allow a free circulation of air to let the moisture out, the greater part of the troubles of winter plastering would disappear. No time is gained by not doing this, and it is a mistake to think that a building can be plastered quicker by starting the work before the building is properly heated. On the contrary, it is much quicker to delay starting the plastering until the heating apparatus is in working order, as the plaster dries out within a few day's time in this case, whereas it is liable to be weeks and months when this is not done.

With a temperature sufficiently high to evaporate the moisture the plaster dries quickly, and the rest of the work can follow at once, but the usual method is not to wait until the heating apparatus is in order, but to inclose the building with muslin screens and use stoves, salamanders or open fires to dry out the building. Usually the fires are not kept going at night, and in consequence the building (which has probably been overheated in the day time, as is always the case of the ceilings in the rooms in which the stoves or salamanders are placed) is allowed to become cold at night. The chances are, too, that no precaution has been taken during the day time to permit a draft of air to circulate through the rooms to carry off the moisture. What is the result? The heat of the day vaporizes the moisture, and the cold of the night, after the fires are out, again condenses it and it settles on the plastered walls and is absorbed, or if the temperature is very low the moisture freezes on the face of the plaster, which is found covered with ice the next morning. In many cases this process of heating by day and cooling by night is kept up for weeks, with the moisture for the greater part still in the building at the end of that time, or possibly a sufficient amount of it has been gotten out to make the plaster appear sufficiently hard to finish, and the finish coat is applied. Each coat should be thoroughly dry before the next coat is applied.

After applying the finish coat of plaster all moisture from the under coats has to dry through the finish coat, and as the finish coat is denser and more compact than the under coats it takes very much longer for the latter to become dry after the finish coat has been applied than if this drying had taken place before the application of the last coat. The results are usually as follows:

1. The Effect of Dampness Remaining in Plaster.—The most serious effect of plaster remaining damp and soggy and not drying out in proper time is to cause it to lose its set or strength, and in consequence it does not become hard. In other words, the result is the same as if the plaster has been retempered. It is a well-known fact that with plasters or Portland cements when they are retempered their strength is lost. As time goes by, therefore, the plaster that has been allowed to remain wet and soggy dries out, but it is very apt to fall from the wall or crumble away like so much sand,

2. Staining Due to Dampness.—The scratch and browning coats of plaster should be perfectly dry before the finish coat is applied. If the finish coat is applied before the scratch and browning coats are dry any staining from the wood lath (sap) or from brick or terra cotta walls will be carried by the dampness through to the surface of the finish coat, leaving a discoloration or stain. All moisture in the scratch and browning coats, and for that matter in the brick walls as well, dries out through the finish coat, with the result that the latter remains damp until this moisture has entirely dried out. This seriously injures the finish coat and it is liable to remain soft. In large office buildings where the walls are massive the dampness remains in the plaster for a long time and beads of water are frequently seen standing on its surface. In case of brick walls, when the water evaporates it leaves long, fine crystals of substances that have been brought to the surface in solution. Usually these substances are crystals of carbonate of soda, chloride of soda or other soluble salts. The use of damp proof paints on brick or terra cotta walls, before plaster is applied, prevents much dampness coming through the plaster, and they should be used whenever possible.

3. Effect of Frost on Scratch and Browning Coats of Plaster.—The general effect of frost on plaster is to seriously injure its binding qualities or strength. The plaster becomes soft and does not set hard, and the plastered wall that has been frozen is liable to fall. If the frost has gotten into the first or scratch coat of plaster and caused it to lose its strength, it will not be strong enough to hold up the two succeeding coats (browning and finish), even though no frost has gotten into these last two coats; but should the scratch coat [illegible] to such an extent [illegible] will thaw out, and in this process push off the browning and finish coats.

It is not an uncommon thing to see the browning coat separate from the scratch coat in large sheets where frost has affected the latter. In like manner, if frost gets into the second or browning coat this will be damaged, as in the case of the scratch coat, and if the third or finish coat is applied while frost is still in the browning coat the finish will be pushed off in sheets when the frost thaws out, just as was the case of frost in the scratch coat.

4. Effect of Frost on The Finish Coat of Plaster.—Frost causes the finish coat of plaster to become soft and chalky, and without strength or hardness. The finishing coat rubs off like whitewash and is a constant source of annoyance to the occupants of the house.

5. Plaster Appears Dry.—Scratch and browning coats of plaster appear to be dry on the surface when, in reality, underneath the surface they are still wet. This appearance is often misleading, and the finish coat is applied too soon, with the result of having the finish coat remain damp until all the moisture has dried out from the under coats. As the finish coat is less porous than the scratch or browning coats it naturally takes longer for a wall to dry that has had the finish coat applied while the under coats are still wet than if the moisture in the under coats were allowed to dry out before applying the finish coat. This dampness in plaster is the cause of the disfigurement of decorations.

6. Staining and Cracking Due to Use of Salamanders and Coke Pots.—The sulphur and smoke from the coke or coal used in the salamander disfigure plaster. The smoke blackens the wall, but the sulphur of the coke unites with the lime in the finish of the plaster and forms sulphide of lime, which is yellow. These are the yellow spots or blotches that appear so often on the surface of plaster that has been applied in winter time. As the sulphur only unites with lime when it is damp, these yellow stains appear in round spots, the moisture drying out in small circles, just as if water were dropped on blotting paper and were allowed to dry. These small damp spots absorb the sulphur of the coke and cause an unsightly wall. The small furnace used by the plumber also adds to this yellow staining. Coke pots when placed too near the recently plastered wall are apt to dry it too quickly, and in consequence draw the wood lath, causing the lath to twist or buckle and the plaster to crack.

7. Decorating on Plaster that is not Thoroughly Dry.—When plaster is damp, as shown above, the lime, which is a constituent of the finish coat of all plasters (there is no exception to this rule), acts as a bleaching agent. Paper applied on damp plaster, therefore, will not fade or discolor, and paint or kalsomine will be similarly affected. Naturally, the more delicate the tints of paper or kalsomine, the more liable they are to be affected. Often rooms are repapered and repainted, and even the second application of paper or paint is applied. If the dampness in the wall is excessive the paint is pushed off from the plaster and peels off in spots several inches in diameter.

Walls should be thoroughly dried before they are decorated, and this takes time. If proper care has been taken in heating the building when the plaster was being applied, and this heat has been kept up until the [illegible] is dried, the walls are hard and [illegible] is no reason why, with proper precaution, the walls cannot be decorated. Paint is very much less affected than kalsomine or paper. Delicate shades of either are more liable to damage, but if the walls are properly sized they can be decorated with satisfactory results. If very expensive decorations are to be made directly on the surface of the plastered walls it is best to allow the walls to become seasoned for at least one year. When decorations are on canvas, or if burlap is used instead of wall paper, [illegible] is expedient. The trouble lies in the mistake that plaster that is hard and does not feel wet to the touch is [illegible] to persons to be dry, but this is far from the truth.

As poor drying conditions in winter are the cause of the troubles of plastering in winter, replace them with proper drying conditions and there will be no trouble. This can be easily brought about by observing the following simple precautions:

1. A building should be well inclosed. Nothing is gained in time by starting plastering before a building is properly ready to be plastered.

2. A building should be well heated by furnace, steam or hot water heat. Salamanders, coke pots, stoves or open fires should not be used. They are not necessary and their use does not hasten the work. If however they are used their bad effects can be materially lessened if care be taken in their use. In case of coke pots or salamanders, have them lighted out of doors, so that the first smoke will pass away and the coke become well ignited before they are placed in the house. Coke should always be used and not coal, as there is less sulphur in coke and less smoke than in coal.

3. A building should be well ventilated. The windows should be opened from the top in the day time and closed at night. This allows the current of air to circulate through the building and carry out the dampness. It is a great mistake to keep the building tightly closed during the time it is being plastered. Fresh air is a good dryer.

4. If the precautions in regard to properly inclosing, heating and ventilation are looked after carefully there will be little trouble in winter plastering. It is not well to paper or paint too soon on new plastering. Even under the best conditions the plaster finish acts as a bleaching agent, and it should be well seasoned before it is decorated. When it is necessary to decorate quickly the precaution should be taken of using canvas or an extra heavy coat of sizing before either papering or painting.

CHICAGO FOUNDATIONS.

Horace says in De Arte Poetica, "It is difficult to treat common topics with originality." There has been so much written regarding foundations for high buildings in Chicago that it is difficult to write anything that is not trite, and it is practically impossible to say anything new. The soil on which Chicago is built consists of loam and made ground down to datum, about 14 ft. below street grade, then comes a layer of hard, stiff blue clay 6 to 12 ft. thick; below this the clay, while generally of the same character as the hard stratum above, becomes softer, and remains soft to a depth of 60 to 70 ft. below street grade. This soft layer, as a general thing, only differs from the hard layer above in the amount of water it contains, and the buildings in their settlement squeeze out this water, thus increasing the thickness of the hard layer.

When the foundations of the new post office were put in, extremely hard clay, that had to be cut out with knives and thrown into the wagons with pitchforks was found down to a depth of 35 or 36 ft., although when buildings near it were built soft clay was found at about 20 ft. below grade.

It was found early in the use of spread footings that it was not advisable to dig into the hard stratum at all. The foundations where placed upon this hard stratum wherever it was found, and this in some cases only allowed a clear height in the basement of 7½ or 8 ft. Before the Masonic Temple was built, the soil was tested by supporting a tank on a plate having an area of 2 sq. ft. This tank was gradually filled with water. The final load was 5,650 lbs. per sq. ft. Two tests were made, each lasting about 100 hours. In one test the plate rested directly on the top of the hard clay. In the second test the plate was placed at the bottom of an excavation in the hard clay 2 ft. 4 in. deep. The total settlement in test No. 1 was 1-13/16 in. and in No. 2 1¼ in. Below this soft clay comes a very hard [illegible] sizes, some of them being 5 or 6 ft. in diameter. This [illegible] down to either the rock or a layer of [illegible] and gravel of varying thickness which occasionally overlies the rock. Rock is found in the downtown districts at about 100 ft. below street grade. In an artesian well sunk at the Chicago & Northwestern office building now being completed this limestone rock started at 100 ft. below datum and continued down to 434, then came a layer of blue shale 53 ft. thick, then 350 ft. of limstone, then 160 ft. of soft white sandstone, then 300 ft. of limestone, and finally at 1,400 ft. a white sandstone was found which contained water in sufficient quantity rising to within 100 ft. of the surface.

The old masonry foundations of the four to six-storey buildings erected after the fire were, of course, spread foundations, and their load on the clay ran from 8,000 to 15,000 lb. per sq. ft. There must have been great settlements, but with the streets varying so much in grade as they did, and with the masonry buildings, it did not make much difference how much they settled. However, as the heights of buildings increased and more room in the basements for mechanical plants became a necessity, it was found that some other kind of foundation was required, and the spread footing made of layers of beams imbedded in concrete followed naturally. The settlements of buildings supported upon these spread foundations were considerable, ranging from 8 in. to as much as 30 in. This settlement is anticipated when construction is begun by raising the level of the bottom of the footings by the amount it is thought the buildings will settle. This causes the sidewalks to be steep at first, but they approach their proper slope as the buildings settle. The foundations of the Great Northern Theatre were raised 9 in.

It has also been found that the tall buildings with spread foundations do not stop settling. This contiinal settlement is caused by the wind tending to reduce the pressure on the soil on the windward and increasing it on the leeward side. Some of the tallest buildings erected 12 to 15 years ago are still settling—very slightly, it is true, but the movement is enough to be detected. Another fact noted is that all the tall steel buildings lean north and east. This is due to the fact that in the spring and summer, when the buildings are being erected, the prevailing winds are from the southwest, and as the greatest settlement occurs during erection, this constant pressure against the unfinished structures is sufficient to cause them to lean slightly.

The following incident will show how great is the initial settlement. In the Masonic Temple four of the main columns, near the lifts, carry heavy loads and have large footings, and between them are two small columns which only carry the stairs. As these had much smaller footings than any others in the building, they were given a high load per square foot. During the construction of the building the four columns had received the greater portion of their loads when the erection of the stairs was begun. It was found at once that the connections on the stairs would not fit those on the columns, the latter being too high. Levels, taken to ascertain whether the small columns had been forced up, showed that they simply had not settled with the rest of the building. About 75 tons of pig iron were then loaded on both footings and allowed to remain for a week. Although the load then amounted to 7,000 lb. per square foot, twice the load on any [illegible] in., less than one-half the desired amount, and so the connections had to be changed all the way up the stairs.

It was found early in the history of floating foundations that live load must not be considered when designing foundations. The reason for that is that the foundations get the dead load immediately, but the live load does not come on until the building is finished and the greater part of the settlement has taken place.

One of the finest buildings in Chicago, a wholesale warehouse building nearly 300 ft. high, was designed by a Boston architect. He proportioned the foundations [illegible] The result was that the outside walls, where the percentage of dead load was very great, settled at once, and the interior columns, where the percentage of live load predominated, did not settle. If you go into that building today you will see porters helping the regular truckmen to wheel their trucks up the hills caused by the curve in the floors.

The great settlement of buildings in these floating foundations and the necessity for increased basement height, owing to the increasing use of water tube boilers and other improvements in the mechanical plant, lead to the gradual abandonment of this style of foundation, notwithstanding its cheapness. But the chief reason for the change and the discarding of the spread footings was the building of the tunnel by the Illinois Tunnel Co. This was a remarkable piece of work. Thirty miles of this tunnel 40 ft. below street grade have been completed, and the whole work has been carried on without any tearing up of the streets. Indeed, very few people in Chicago knew it was being built until it was practically completed. Shafts were sunk at curb line, and the dirt was hoisted through these shafts and carried away at night. This tunnel, together with the present agitation about subways for the street car lines, render the concrete walls going to rock, the only safe method of constructing foundations for high buildings in the business districts.

* A paper by Mr. E. C. Shankland in the "Technograph" of the Engineering Societies of the University of Illinois.

Many of the buildings now being erected have basements going down to the level of this tunnel. A great deal of the clay excavated in foundations of buildings is now taken out to the lake through the tunnel, saving the teaming of it through the streets.

While most of the large warehouses along the river are on piles and a few in the business center rest on piles, yet a very large percentage of the buildings put up in the past five or six years rest on concrete caissons. Concrete wells would be a better name, as they are simply holes dug just as ordinary wells are and filled with concrete. These were first used in Chicago in the Stock Exchange erected in 1892, but two years before this the City Hall in Kansas City was built upon steel shells going down to rock, excavated and filled up with hard brick laid in Portland cement. Excessive loads were carried on Z-bar columns passing through the centres of the piers and going down to rock. The site of the building was formerly a ravine between abrupt bluffs. These had been so cut away and levelled as to leave a 50-ft. filling of rubbish under two-thirds of the building and a solid clay bank under the other third. The fill was made by its use as a public dump. This is the first building I know of to make use of this kind of foundation.

The concrete wells as now built are put down 4 or 5 ft. and then lined with wooden lagging 2 to 3 in. thick, tongued and grooved, and either 4 ft. or 5 ft. 4 in. long. Each section of this lagging is held in place by two steel bars, generally 4 in. wide by ¾ in. thick, made semi-circular, in two pieces turned up at the ends, so they can be bolted together. If the ground is unusually soft three rings are used in each section, and the sections are made shorter. When the first section is lined a new section is dug and lined up, and so on down to the hard clay 60 or 70 ft., or to the rock, as the case may be.

Where the wells are only carried down to the hard clay they are belled out at the bottom to twice the diameter of the shaft, but if carried down to the rock, which is the better way, they are not belled. When the holes are excavated to the bottom the concreting is begun and the rings are taken out as the work of filling progresses. Sometimes the lagging is also taken out, but this is not done as a general thing. When soft, swelling clay is found, or where the well is close to a high building previously erected on spread footings, both the rings and lagging are left in as a means of safety.

It is sometimes necessary to use iron shells for lagging for a portion of the distance. In the Chicago Edison building recently erected at the corner of Monroe and Washington Sts. a very soft sand stratum full of water was discovered at a depth of 85 ft. It is also be called quicksand. In [illegible] and drive them down ahead of the digging, as that was the only way the water could be kept out by the pumps.

These wells do not settle in themselves, still they cause some settlement to adjoining buildings. This is due to the impossibility of digging the clay so that the lagging will fit close to it. There are bound to be vacant spaces back of the lagging which will be filled up later by the earth pressure, and this movement will show itself in the settlement of the foundations of the buildings close by. Slight settlements in a building across a 40 ft. street have been known to occur, presumably from this cause.

With spread footings the maximum load on the clay was 3,500 lb. per square foot, generally a load of 3,000 lb. per foot was used. Concrete wells are proportioned for a load of 40,000 to 45,000 lb. per square foot at the top. This means for a belled well, about 14,000 lb. per square foot on the clay and about 60,000 lb per square foot if it is carried down to rock. For piles the maximum load allowed by the city ordinance is 25 tons per pile, but generally the load does not exceed 20 tons per pile, although 50-ft piles, driven to a stand, are good for 50 tons.

One great advantage of concrete wells is that they can be constructed before the old building is taken down. When Schlesinger & May built their corner store on State & Madison Sts. all the wells for the new building were put in without the crowds in the store knowing anything about it, and the crowds were unusually great, as the work was done during the Christmas shopping season. Of course, part of the basement had to be given up, but all the dirt excavated was hauled away at night.

At the present time wells are being sunk in the basement of a five story building at the corner of Monroe and LaSalle Sts., which had been occupied up to May 1st, when the building was torn down to make way for the Northern Trust Bank building. This saves from 30 to 60 days in erecting the building, a very important item.

Another form of foundations which has not been mentioned is concrete piling in places where wooden piles or spread footings cannot be used and concrete wells are too expensive. Wooden piles have to be cut off at or below datum, which is 14 to 15 feet below the surface of the ground. This is all right where there are basements, but in some cases a basement is not required. Then, if wooden piles are used, the footings will have to be excavated to datum, the piles driven and cut off at datum or lower, and a stone or concrete pier built up to the basement floor. This is very expensive.

A good example is the power house recently erected by the Union Electric Co. at Dubuque, Iowa. The site is on the bank of the Mississippi River, on sand. No basement was required. The variation of the gauge of the river at that point is about 22½ ft., and the ground at that point was about the level of high water. Spread footings were out of the question, and if wooden piles were used the piers would have to be excavated to a depth of 22½ ft. This was equally out of the question, but concrete piles solved the difficulty.

One of the most interesting and very often one of the most difficult problems in the constructional design of a tall building is the foundation for the party wall. An example is the Great Northern Theatre hotel building running from Jackson to Quincy and adjoining the Great Northern Hotel on the east. The east wall is a party wall, with foundations 22 in. wide. The theatre is in the center of the east building, and its walls, running east and west and carrying the walls of the building above the theater, weigh 60 tons per linear foot.

The problem was to take care of this wall where it ran over the east side of the party wall and joined the wall. It was done by cutting through the party wall and putting in girders parallel to the theatre walls and supporting them. These girders were supported on 30-ton jack screws, and as the new building settled the addition to the two theater walls there were four other points where the new building joined the party wall, and these were also put on screws. The theater building is about 10 years old, and the screws are still being watched. When the settlement has stopped the jacks will be imbedded in concrete.

In the case of the Journal building there was no party wall contact on either side. It was, therefore necessary to keep entirely on the lot. There are four columns in a row traversely, and these columns rest on double cantilever girders the full width of the lot, 41 ft., and these rest on piles which it was not necessary to drive closer than 6 to 7 ft. from the walls of the adjoining buildings.

One of the earlier examples of cantilever girders is the Rand-McNally building erected in 1889. This building is on spread foundations. While party walls were desirable when spread footings were used, the contrary is the case now that concrete wells are in such general use. The wells can be kept entirely on the property, and cantilever girders in the foundation will allow the columns to be put close to the lot line. In the Chicago & Northwestern office building there are cantilever girders in the foundations weighing over 26 tons apiece.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Young Workman": Is there any method by which the shingles on a "hip-rafter" can be done in such a manner as to do do away with the necessity of a "ridge roll"?

ANS.—There is a method much employed in Newfoundland and the Maritime Provinces which is done as follows: It will be seen that in Fig. 1 the hip shingle

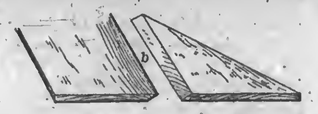


FIG. 1.

is shown with the grain running parallel with the hip of the roof. It will be noticed that the shingle is cut on a bevel in such a way that the second one can be nailed down on it tightly as the work progresses. The letter b represents the upper side of the hip shingle, while the second one, or that at the left, is bevelled on the underside to suit the hip shingle. Fig. 2 gives an

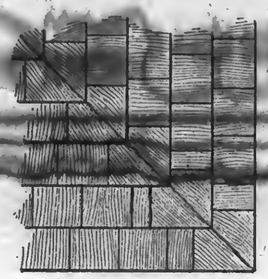


FIG. 2.

idea of the appearance of the single hip when it is finished. By this method, when properly executed, a good water tight ridge is secured, and the necessity of a roll or ridge board is done away with and the roof will should be painted and a heavy coat of paint used on the hip will lengthen the life of the shingles many years.

From "Builder": I have been asked to prepare some sketches for a small hospital, and the promoters of the scheme lay great stress on its ventilation, and I would be pleased if you would describe the various methods employed for getting the best results. The building—if erected—will be brick, and heated throughout with hot-water.

ANS.—There are a number of methods of ventilating a building of more or less merit. The first method, which, however, can hardly be termed a system, is to rely upon windows and openings in the roof for ventilation, and upon ordinary fireplaces or stoves for heating. The second method is what is termed the natural system. Fresh air is admitted by Tobintubes, and foul air extracted by means of Boyle outlets, through the roof, the area of each opening being carefully proportioned to the size of the hospital, and the inlets being provided with valves, so that the supply of air may be regulated. The warming may be done either by stoves or by hot-water pipes and radiators. The quantity and the diameter of the pipe are also determined by the cubic contents of the room to be heated, and if this would imply more than three rows of pipes, radiators are fixed in suitable positions, generally placed in front of windows where the air in the room is cooled by the glass. The third method is what is called the artificial system, and ventilation may be either the plenum or the vacuum method. By the plenum method the air is taken in from an opening in the hospital grounds away from all dust and chimneys and other means of comtamination, drawn through a tube into the ventilator room, is there filtered, warmed, damped, and by means of ventilating fans driven along channels into the various wards of the hospital. The vacuum method is arranged similarly, except that the fans are placed in the upper part of the ward, and drive out the foul air at once, drawing the fresh air through the channels provided, as for the plenum method. Another system, which however, cannot be recommended, is the downcast system, where the inlets are placed say half-way up the wall, and the outlets at the skirting level. These outlets must all be joined to one channel, and a fan or other method of creating current must be employed, as this inverted method is contrary to all natural laws. The direction of the currents of air from the human body is, under ordinary conditions, upwards, owing to the heat of the body, and this current is an assistance to upward and an obstacle to downward ventilation. The heat from all gas flames, or other means of lighting, tends to assist upward ventilation, and elaborate arrangements have to be made to prevent contamination of the air by the lights if the downward method is adopted. About three times the quantity of air must be introduced in the downward method than is found to give satisfactory results with the upward method, and therefore the machinery required in all downward method must be of three times the capacity of that required for the upward method.

From "Bricklayer": Will you please describe the method of calculating the quantities of aggregate and cement required for concrete [illegible]

ANS.—The quantity of concrete that will be contained in the finished work must first be calculated by multiplying together the length, breadth, and thickness of the space, and reducing to cubic yards. A cubic yard of concrete (containing, as it does, 22 bushels) may require as much as 40 bushels of materials, or a very much less quantity, according to the nature of the ingredients. A great deal depends on the size to which the aggregate is broken; stone that is broken to 2½ in. gauge contains, in every cubic yard, 10 cub. ft. of spaces or hollows between the stones, while common gravel contains only 4½ ft. of such voids that must be filled with the other materials. The examples of various kinds of concrete that are given below will enable the querist to form an estimate of the quantities of materials that will be required in the case that he is considering. A block of concrete that was made with 8 bushels of crushed bricks to 2 bushels of cement, measured when set 11,687 cub. in. or in the proportion of 40 bushels to the yard. Another block that was

made with 6 bushels of bricks to 1 bushel of cement, worked out to 37 bushels of materials per cubic yard. A yard of concrete that is composed of 1 of cement, to 2 of sand and 6 of shingle requires 27 ft. of shingle, 9 ft. of sand, and 4½ ft. of cement, together with 25 gal. of water. Concrete that is composed of 1 of cement to 1 of sand and 6 of broken bricks requires 30 ft. of bricks of 3-in. gauge, 10 ft. of sand, 5 ft. of cement, and 12 gal. of water. Concrete that is composed of 3 of cement to 7 of ordinary gravel will require 33 ft. of gravel, 4½ of cement and 30 gal. of water. The examples that are given above will enable the querist to form an idea of the quantities that he will require, but the actual quantities can only be found by making a few yards with careful measurements. The querist must not forget also that when the concrete is rammed, it looses about one-tenth of its bulk. A bushel contains 1.284 cub. ft.

From "Apprentice": Is it necessary that a hip rafter should be backed; and if so kindly describe the proper method of getting the bevels for the backing?

Ans.—We have answered these questions on a former occasion and do so again in a somewhat different manner. To the first question we may say, that where the hip is only two inches in thickness, it is hardly necessary to back the hip though it would be better to do so, but where hips are more than two inches thick they should be backed. As to the method of backing, there is a half-dozen different ways. The method shown at Fig. 3, however, is the oldest and most

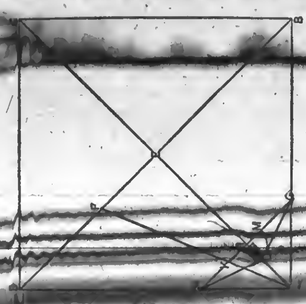


Fig. 3.

scientific and is not at all difficult. Referring to the diagram Fig. 3. Let A B C D be a plan of the building. Draw the diagonal lines A C and B D; set up E F for the rise of roof; then A F will be the length of hip rafter. Make A H and A G equal. Draw G H; then with one foot of dividers at 1 make an arc cutting the hip at K; then draw L G and L H. Set the bevel by the line A E, and L H or L G, and you have the required angle for backing.

From "Contractor": Will you please describe a good method of putting on a tar and gravel roof and the kind of materials to use?

Ans.—In reply to this query we reproduce a specification for this kind of work which has been adopted by many roofers, and has been found efficient and durable. The specification is to the following effect: "The roof construction shall not exceed two inches fall to the foot, 1 inch would be better. The sheathing boards should be of an even thickness laid close both at ends and edges and securely nailed on each edge at all bearings. Over the sheathing when thus laid place one thickness of a good roofing paper; this in turn being covered with four thicknesses of No. 1 roofing felt, the felt not to exceed 32 inches in width, and the total weight of the four thicknesses not to be less than 52 pounds per square of 100 feet. Each thickness is to be turned up and well mopped between with hot roofing cement. A galvanized eave finish is to be put on all around the edges of the roof to form a stop. All wall connections, chimneys, skylights and other openings to have galvanized iron flashings over the surface or felt. A good even coat of roofing cement is to be flowed, the cement in no case to be hot enough to injure the woolly fibre of the felt, and not less than 8 gallons of cement per square of 100 feet to be used, including that for mopping between the layers of felt. Upon this spread, while the cement is hot, a good even coat of clean seashore gravel or crushed stone, the latter to be free from dust and dirt, and none to be used except what will pass through a ⅝ inch mesh screen and be caught on a ¼ inch mesh screen. This roof, put on by a reliable man, will easily last ten years without repairs and cost about $4 or $5 per square complete, not including timber.

From "Painter": Please advise me of the best method of making a good permanent job of work in painting a plastered wall?

Ans.—In painting plaster, white lead and linseed oil, with a small quantity of driers, are recommended. The coat should be of the consistence of thin cream, so that the oil is absorbed into the plaster in a few hours. In a day or two another thicker coat may be applied, and a third a few days later, rather thicker, followed by the finishing coat. Four coats are not too much for good work. By the absorption of the oil into the plaster the substance becomes hardened and may be washed.

From "A Mason": I am about to build a curling rink 150 feet long by 40 feet wide and wish to lay a cement bottom in it, will you please inform me of the best method of doing this work and oblige?

Ans.—The site should first be made perfectly level and a clay subsoil will be a distinct advantage. The site, after it had been levelled, should be covered with rough concrete about 6 in. thick, made in the proportion of 4 parts broken stone, 2 parts crushed stone or sand, and 1 part of best Portland cement. To ensure getting an even thickness of concrete pins should be driven in the ground at frequent intervals and allowed to project 6 in. from the surface; the concrete is then laid to the level of the top of the pegs. The pins are withdrawn after the concrete has set, and the whole surface is then grouted with cement and sand in the proportion of 1½ to 1; the upper surface should then be covered with fine concrete, formed of 1½ parts of sand to 1 part of cement. A floor of this kind, however, is very likely to crack with the heat of the summer, if not properly protected, and instead of an upper surface of fine concrete the better plan will be to use best natural asphalt. A curb in concrete or stone should be laid round the edge of the floor so as to retain the water, and a drain provided with a valve should be constructed in order that the water may be drawn off if necessary.

MONTREAL NOTES.

The subject of a new look-out for the mountain has been much to the front lately. To be so much debated, however, it is a subject which seems to give very little real concern. It has already been pointed out, in these notes some time ago, how schemes were brought forward, entered upon, half erected and then cleared away again with great lightness of heart. On the last occasion on which the look-out has been under consideration the sub-committee appointed to deal with the subject advertised in the daily papers for plans from "landscape architects, architects and others," and in response received two sets of designs. This of course does not fairly represent the interest which such an occasion ought to arouse. The fact of the matter was, of course, that the conditions attached to the competition were such as no architect of standing would be at all inclined to comply with, and quite at variance with the conditions recommended by the Province of Quebec Association of Architects. Now it would surely be to the advantage both of the city councillors and of the association of architects, to say nothing of the city, that in cases of this kind they should work hand in hand and not at cross purposes. There is probably in a case like this no manner of bad understanding between the two bodies concerned, the fact being simply that there exists no understanding at all, each going on his own way, blissfully unmindful of the other's existence. It would be a happy thought on the part of either one to make the other's acquaintance, and the business of the public in such matters as this would then stand a chance of being creditably done.

So much building is now going on in Sherbrooke Street that the whole aspect of this, the finest driveway of Montreal, will soon have greatly changed. Most of the new buildings about hold their own with the older ones, in point of architectural merit, but are of a very different character. The old separate private houses with grounds around them are disappearing—some of them literally falling to pieces, owing to the treacherous streak of soft blue clay which traverses this neighborhood. The new buildings are big flats and other extensions, which prefer to dispense with [illegible] and are rapidly becoming a boulevard and will probably be a very magnificent one.

One of the new Sherbrooke Street buildings, Strathcona Hall, at the corner of McGill College Avenue and almost opposite the principal gate of the College grounds, was formally opened on Saturday, 7th October. The building is the quarters of the McGill College branch of the Young Men's Christian Association, and contains rooms for about 60 students, besides dining and recreation rooms. Externally the facade towards Sherbrooke Street has been carefully designed and detailed, the work being executed in cream coloured sandstone. One is left wondering however why the elevation towards McGill College Avenue should have been executed in brick. It is true the brick seems to be of some unusual and specially selected sort, but, as architecture, a two faced treatment of this kind is impossible and regrettable.

The Mount Royal Club House, also in Sherbrooke Street, is now roofed in. The building, which is designed by Messrs. McKim, Mead & White, is of simple design, severe even to Spartan severity, but needless to say detracts nothing from the dignity of the neighbourhood.

Farther eastward the Students' Union building is now rapidly approaching the roof line. This building is also severely designed, and, like the Mount Royal Club House, it is built entirely of Montreal limestone.

Eastward still and also in Sherbrooke Street a new Commercial and Technical School is about to be erected by the Protestant Board of School Commissioners. The design, prints of which have been published in the daily papers, promise a fine building. The architect is Mr. A. F. Dunlop.

Messrs. Maxwell Bros. have now got well under weigh with the erection of their design for a nurses' home at the Royal Victoria Hospital, which they valiantly hope to have ready for the roof before the arrival of severe weather.

Concordia Salus.

THE SKETCH CLUB, P.Q.A.A.

The Sketch Club of the Province of Quebec Association of Architects held the first of their Winter Series of meetings in the Rooms of the Association, 5 Beaver Hall Square, on Friday, 13th October, the President, Mr. C. S. Burgess, A.R.I.B.A., in the chair. Between twenty and thirty members were present.

This being the first Winter session of the Club, the president devoted the principal part of his opening address to a statement of the proposed method of carrying on the season's work. This is arranged for as follows:

Two sub-committees have been appointed, one to take charge of all competitive design and prize work, and the other to arrange monthly programmes of lectures and addresses.

The competition committee consists of Mr. J. Archibald, President of the P.Q.A.A., Mr. W. S. Maxwell and Prof. P. E. Nobbs. These gentlemen have drawn up a code regulating the competitive work to be engaged in by the club, and have instituted three classes of competition. The first of these is a competition in measured drawings of old work in the Province of Quebec and the Lower Provinces. This was announced [illegible] before the end of October. The prize, of $40, is this [illegible] competitions is that of Monthly designs—the work to be done at home—a prize being given for each month's design, and another in addition presented by the P.Q.A.A. for the student who shall distinguish himself most in the series. A third class of competition is the Sketch Competition. In this it is intended that the subject shall be set and the work of designing be done entirely at the club rooms within the space of an evening. The reward in this case will be that the victor shall have his name engraved on a pewter pot to be kept at the club rooms for the purpose.

For the lectures and addresses it is proposed to have speakers from within the profession and from without so that members may get a pretty all round view of themselves. Special points are to be made of literary reviews by members, as introduction to discussions, and also of debates on subjects open to difference of opinion. The committee appointed to superintend this part of the work consists of Mr. Jos. Venne, Mr. Fortin and Mr. Burgess.

At the introductory meeting, after the programme had been explained, a general discussion as to management of details took place. It was arranged by vote to hold the meetings, which are to be weekly, upon Wednesdays. Mr. W. S. Maxwell made a number of suggestions as to the method of work on the Sketch Competitions, the first of which was arranged for Wednesday, 18th October. After the adjournment of the meeting, retreshments were served in the Library of the Association.

BACHELOR OF ARCHITECTURE COURSE AT McGILL UNIVERSITY.

It has been announced that there are this year fifteen students attending the Architectural Classes at McGill University. As this is a substantial increase on previous years it seems to indicate a growing inclination towards the scholarly method of studying architecture, and Professor Nobbs may at the same time be fairly congratulated on the fruit of his enthusiasm and energy.

ARCHITECTURAL CLASSES.

The architectural classes which have been conducted under the joint auspices of the Ontario Association of Architects and the Toronto Architectural Eighteen Club for the past three years were resumed for the coming season on Monday, October 16th.

The mathematical classes will be conducted as formerly by Mr. A. H. Harkness, B. A., and the arrangements in regard to the studio classes will be announced later. The fees, covering tuition in both courses, are five dollars, payable to the treasurer of the joint committee, Mr. A. H. Gregg, 59 Yonge street.

As regards the mathematical classes, it may be said that the course includes Euclid, Algebra, Trigonometry, Statics, Strength of Materials and Structural Iron Work.

The classes are held in the rooms of the Ontario Association of Architects, No. 96 King street west, Toronto, on every Monday evening beginning at 8 o'clock.

OUR SINFUL EXTRAVAGANCE.*

This North America of ours is vast indeed our natural resources are great and we have [illegible] them as inexhaustible. With ruthless abandon we have devastated our forests; we have worked our lands beyond endurance, our mines, our fields are handled without regard for the morrow. Within but a few years our enconomists have called our attention to this useless waste, and already we find ourselves confronted by a scarcity of certain commodities hitherto thought unlimited. People are just beginning to awaken to the true condition of things.

But of all the useless wastes that we have indulged in, in the United States and in Canada, that of fire, our annual bon-fire, is the most insane, in fact criminal, for by it is property not only devasted, but lives by thousands are sacrificed yearly. Think of it, in 1904 7,000 people were burned, an average of 19 fatalities through fire every day in the year, a record that nearly equals that of all the railroad accidents of the two countries, generally considered by far the most fruitful source of fatal accidents. And the record of 1904 was not an extraordinary one. The increase in deaths by fire has been growing steadily. Our present ratio is about nine lives lost by fire every year for every one hundred thousand of population. In 1900 the ratio was eight, and in 1890 it was five. Unless something drastic be done, what will be the ratio in 1950?

If the loss of life is appalling, the loss of property is disgusting. One hates to think that he is part and parcel of such a race of stupids. Not even China and Japan, with their paper and bamboo houses, submit to such a tax as we do. Our fire-losses are equal to $25 per year per family, and that tax shows but the loss of property actually consumed. We have burned up one thousand millions of dollars' worth in six years! Most losses, so called, are really but exchanges, one product turned into some other form, a loss, perhaps to many, but a gain to some one. Not so with fire. That loss is final, absolute, and the visual one is actual. The only gain to any one is an indirect one to the insurance companies, who profit just so much more by the added anxiety after a fire that new people have to be insured. But the insurance business is not run upon strictly philanthropic lines. The result of the transformation caused by fire is—smoke. $230,000,000 worth of smoke last year! And like last year's death record, the property-loss does not show as a spasmodic increase or something very extraordinary and unlikely to happen again. Even including the Baltimore fire it was but little over the regular increase, a record that has been climbing ever upward, a record that hovered about the sixty million figure in the 70's, the hundred million in the 80's, and that has not been under the one hundred and sixty million limit since 1900.

And mark you, that is the destruction of property. Along with that we throw away $150,000,000 or so more in the maintenance and perfecting of water plants and fire departments, salves to assuage the pain of the sore, not a cure for the malady. Then on top of that we go to work and gamble with the fire insurance companies and pay out countless millions more so that they may reimburse us individually should we suffer a loss through fire! For every [illegible] the individual loser receives as indemnity, the [illegible] has paid out three dollars as insurance premiums! That is the average. I have in mind one city that has paid out in a given time $692,000,000 in premiums, and has received back $107,000,000 for its losses by fire during the same period. An unintelligent speculation, to be sure, but then, what gambling is intelligent.

But leaving aside the accessories, so to speak, and restricting ourselves to the actual destruction of property, the $3,500,000,000 of last year means a daily [illegible] of $9,000,000. Now, inasmuch as that is, we were satisfied some time ago that it did not tell all the [illegible] reports, etc., more or less fallible sources of information that are far from being all comprehending. We were sure that there were hundreds of fires unreported, in interior districts, destroying uninsured property, and where there were no fire departments. So, early in February of this year the Society of Building Commissioners and Inspectors prepared a most elaborate system, albeit expensive, to get all the facts concerning fire for at least a short period. The system was in working order by February 19, and was, I am sure, perfect on the 23rd. During the ten days of the test, from the 19th to the 28th, there were 1,315 fires, totalling a loss of $14,809,800, or one and a half millions a day. True, it so happened that there were some pretty severe fires during that period, but who tells us that there will not be as severe, or more severe ones, later on during the year, just as there were previous to that time?

Granted that the record of a million and a half a day will not obtain the year around, and assuming, indeed, that we will not actually average more than half that amount, still that figure is exceedingly near the mark reached by the new buildings we are daily erecting, and that give such a semblance of progress. At a most liberal estimate we build but a million's worth a day, hence are we destroying perilously near as much as we are creating. Talk of race suicide!

New York averages 8,700 fires a year, Chicago 4,100. We burn up three theatres, three public halls, twelve churches, ten schools, two hospitals, two asylums, two colleges, six apartment-houses, three department-stores, two jails, twenty-six hotels, one hundred and forty flat-houses, and nearly sixteen hundred homes every week of the year. We may say that every person who lives or has business in buildings is more or less exposed to danger by fire, owing to our recklessness, our criminal carelessness and ignorance; but setting aside such broad terms, we have estimates that there are 36,000 lives daily in danger; that is, there are that number of persons directly exposed to fire, persons who escape from burning buildings, lives that are in imminent peril. No war, however bloody, shows any such averages of lives daily exposed to destruction.

And what is being done to prevent this terrible loss? Little, almost hopelessly little, in the way of prevention, though much in the way of palliative. We throw water upon our fires (and are constantly endeavoring to throw it more scientifically) and expect the next fire to burn less fiercely because thereof. In San Francisco, for instance, there is little being done, comparatively, to improve the standard ot construction. It is notoriously a wooden city, yet insurance-rates are fairly low because, forsooth, the *fire-department is excellent*. That is like extolling the advantages of a certain locality as a health resort; it may be miasmatic, yellow fever may stalk amuck, its houses and streets may be foul, but, Glory Be, its doctors are *so* skillful! As far as nature goes, note how little we have done. In all this broad land there are but three thousand buildings that truthfully can be called "fireproof," and that very largely only in their structural parts, that is, fireproof buildings like those in Baltimore whose steel frames and terra-cotta floors withstood the attack where all else about them, the stone, the marble, the wood went the way of all things combustible or destructible.

What the cure [illegible] will be for the accomplishment of the desired end [illegible] water-supply nor fire-department is one of them. The first thing to do is so to surround our old and dangerous buildings with safe-guards, to correct their worst faults where practicable, and to compel their demolition as soon as possible. The second is to absolutely bar the erection of combustible structures in the future. Some would say that that would be a hardship upon the individual, for we have grown so accustomed to using wood that it seems to be the fixed mode of construction, [illegible] by time and custom, a sacred [illegible] any tampering with which must needs savor of sacrilege. Therein lies the folly.

[illegible] wood is almost a luxury. Lumber has gone up in price—over 150 per cent. in the last few years—while fireproof materials, brick, steel, fireproofing tile, cement, et cetera, have been cheapened in cost of manufacture. There is absolutely no economy in building even the simplest cottage of wood. Granted that the first cost in fireproof material is ten per cent. more than the wood. But consider the wear and tear, the maintenance, the insurance, and all such incidentals, and your frame cottage will have cost you in twenty years' time thirty per cent. more than a well-built, non-inflammable structure would have cost.

The deterioration in the value of a well-built, fireproof building, fire-resisting in its finish and decoration, is but one ninth of one per cent. a year, while that of the ordinary joists and stud-partition is nearly four per cent. a year. Besides, such improved construction has a host of other advantages; it is sound-proof, vermin-proof, warmer in winter and cooler in summer, and in every respect vastly superior to the old way of building.

Some weak-hearted ones would have us believe that to bring about those two conditions would involve superhuman effort, well-nigh an impossibility. But our cities have accomplished other reforms quite as revolutionary, and so thought at the time, as this would seem to be. The people sometimes chafe at what they term the restraint of individual liberty, involved in the enforcement of drastic curative laws. But not for long. North American intelligence is such as to readily recognize the value of individual sacrifice involved in a great public benefit. We may not hope, however, to bring the desired conditions about by mild persuasion, by preaching. It will take vigorous action, and the only action that will accomplish anything is the adoption of most stringent building-regulations, and their strict enforcement by competent, executive officers.

Building, in general terms, requires the clearest definition and restriction, while every class of building calls for thoughtful and comprehensive special legislation. If we think that theatre-builders ought to enjoy certain latitude, we have but to scan the record of the Iroquois theatre; if it be suggested that dock-sheds are hardly worthy of special legislation, think of what happened at New Orleans; if wholesale warehouses be deemed unimportant, note what happened in Toronto. And so it is with every class of building. Nothing can be deemed unimportant, for that very building, or class of buildings, may prove the ruin of half your city. Strict building-regulations, I say, are all important and supremely necessary. Two hundred and sixty four of our American and Canadian cities have realized this, for there either have been or are being adopted perfect building-regulations by as many cities. One hundred and sixteen cities or considerable towns heretofore unprovided with a special building officer or department have the creation of such office under consideration. There are happy indices of betterment wherever we may look, thank heaven! but it is just such societies as this, made up of thinking, public spirited men, zealous in the upbuilding of their several municipalities that can do a world of good in facilitating this work and bringing about its consummation even in its own time.

Of all cities that have given thought and earnest work to this matter, Cleveland easily takes the lead. Her building ordinance may be said to be the combined work of nearly all the building experts in the country. A vast sum was spent upon its preparation. Every item was discussed by experts and its effects upon the legal side of the question as well as the technical were carefully weighed by specialists, and the society of which I am an officer, the International Society of Building Commissioners and Inspectors, has virtually advocated that ordinance *in toto* as its model and standard, and is urging every city in both countries to adopt it also with as little change as [illegible] since it is complete, and leaves nothing to the misinterpretation or misjudgment of a perhaps too-lax officer. Every point is covered.

I submit, and you will readily appreciate, that it would be a tremendous advantage to have a uniform code throughout both countries. As it is now, one city will permit of a certain thickness of brick walls to carry a certain height of storey; a city fifteen miles distant therefrom insists upon an entirely different standard. So it is with allowable strains in framing, et cetera. The building business of all the cities is so closely related that this everlasting difference is not only confusing but leads to endless discussion and trouble. A hundred other considerations should compel us to advocate not only good building-regulations, but uniform ones, and I sincerely trust that each one of you gentlemen will not only advocate in his own city the necessity of wise and strict requirements, but that he will go a step farther and strongly urge the council, or whatever power is in charge of that branch of municipal service, to adopt the code that is most worthy of being made standard, and that has already been engrossed upon the statute-book of so many of the cities of the United States and Canada.

* A paper by Alcide Chausse, Architect. Building Inspector of Montreal and Vice-President of the International Society of Building Inspectors, read before the convention of the American Society of Municipal Improvements, at Montreal, September, 1905.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods.

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.
22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	S. G. CURRY,	"
2ND VICE-PRESIDENT	W. A. LANGTON,	
TREASURER	HENRY SIMPSON,	
REGISTRAR	W. R. GREGG, 90 King St.,	Toronto
J. W. SIDDALL		Toronto
JOHN GEMMELL		"
J. WILSON GRAY		"
JOHN E. BELCHER		Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

1ST VICE-PRESIDENT	ALCIDE CHAUSSE,	Montreal
SECRETARY	J. E. VANIER.	
TREASURER	D. R. BROWN.	
JOS. VENNE		Montreal.
H. W. DAVIES		Montreal.
L. A. AMOS		Montreal.
J. Z. RESTHER		Montreal.
J. R. GARDINER		Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DUTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, JR.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNEY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer, 473 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.
H. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. DRAGERY.
C. P. SHINDLER
K. M. FRASER
E. G. BAYNE.
D. BAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: T. C. Latimer, E. Case, F. Powell, M. B. Matheson, D. Cameron, V. L. Bouche, Wm. Alslp, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girold.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAHER, Hon. Treasurer.
J. HERBERT LAUER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY,
GEO. H. HOOD.
Past Presidents

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAUBRAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

PERSONAL.

MARRIED. CURRY—GLASS—At St. Andrew's Church, Toronto, on Wednesday, Oct. 18th, by the Rev. Dr. Parsons, Ellen Stewart Glass to Samuel George Curry, Architect.

The Gutta Percha & Rubber Mfg. Co., of Toronto, have recently issued an attractive and very complete illustrated Catalogue descriptive of their rubber tiling for floor covering.

The Canadian White Co., of Montreal, have been awarded the contract for the new head office building of the Federal Life Assurance Co., Hamilton, Ont., Messrs. Finley & Spence, Montreal, architects. This building will be an eight storey modern steel construction, fire-proof structure. The company take the entire contract and turn the building over for occupancy not later than August 1, 1906.

The Don Valley Brick Works

are now manufacturing

POROUS

TERRA COTTA FIREPROOFING

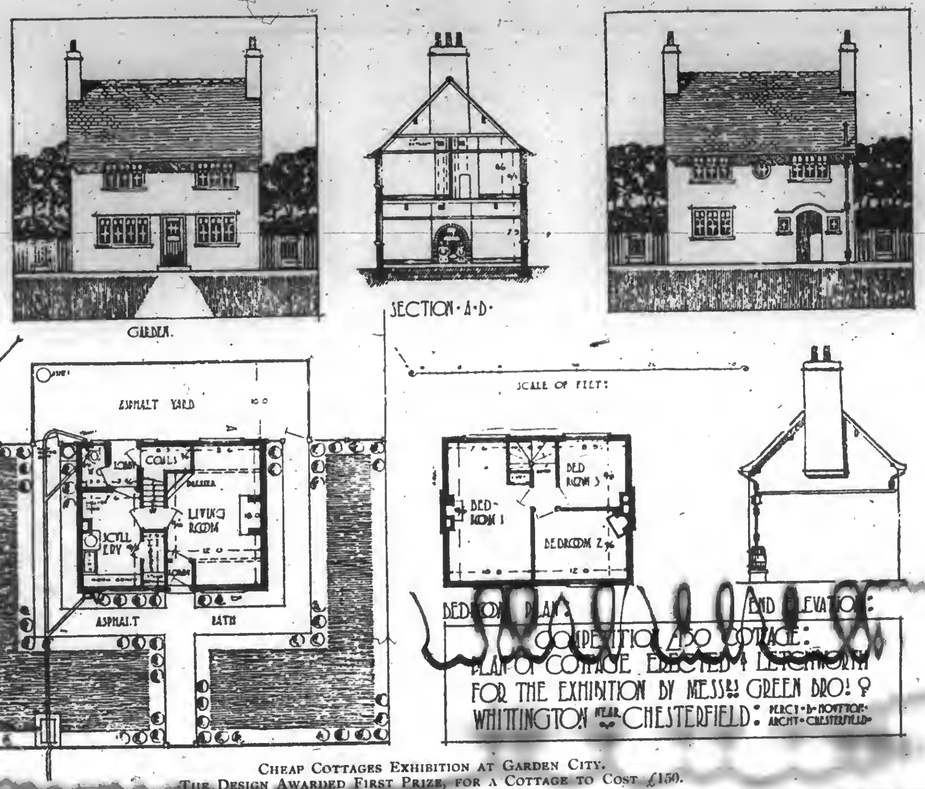
IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

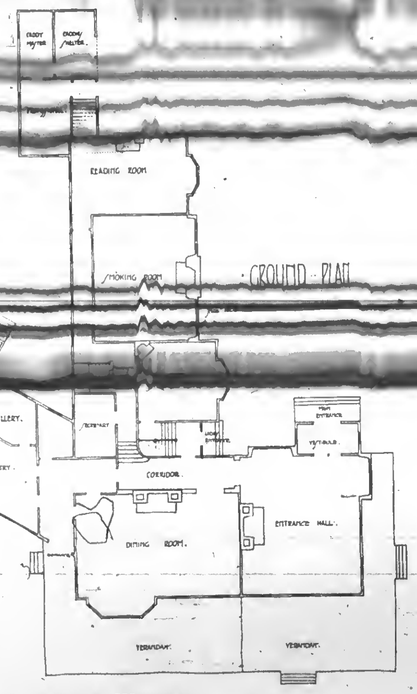
MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices



CHEAP COTTAGES EXHIBITION AT GARDEN CITY.
THE DESIGN AWARDED FIRST PRIZE, FOR A COTTAGE TO COST £150.

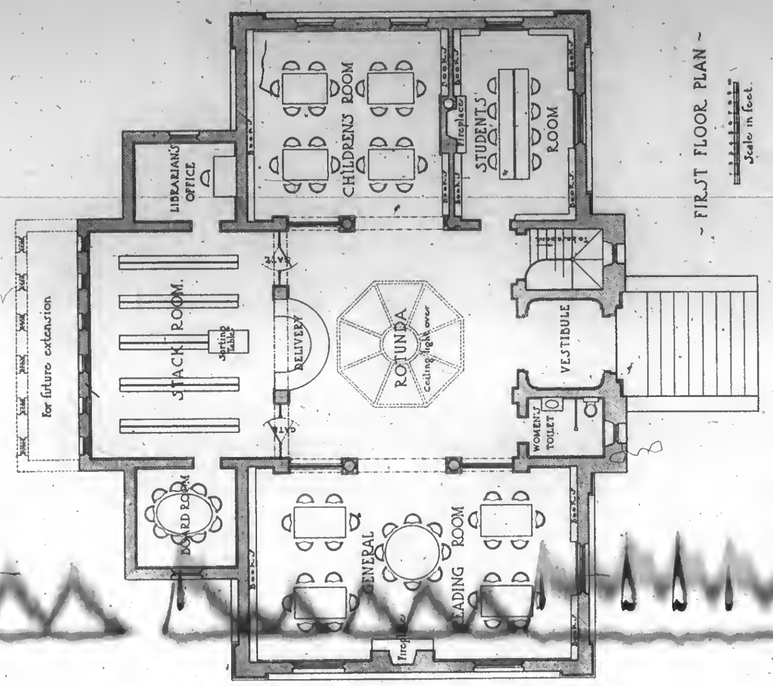
INTERIOR VIEW OF KITCHEN IN WESTERN COTTAGE OF MR. BAILLIE SCOTT'S PAIR.

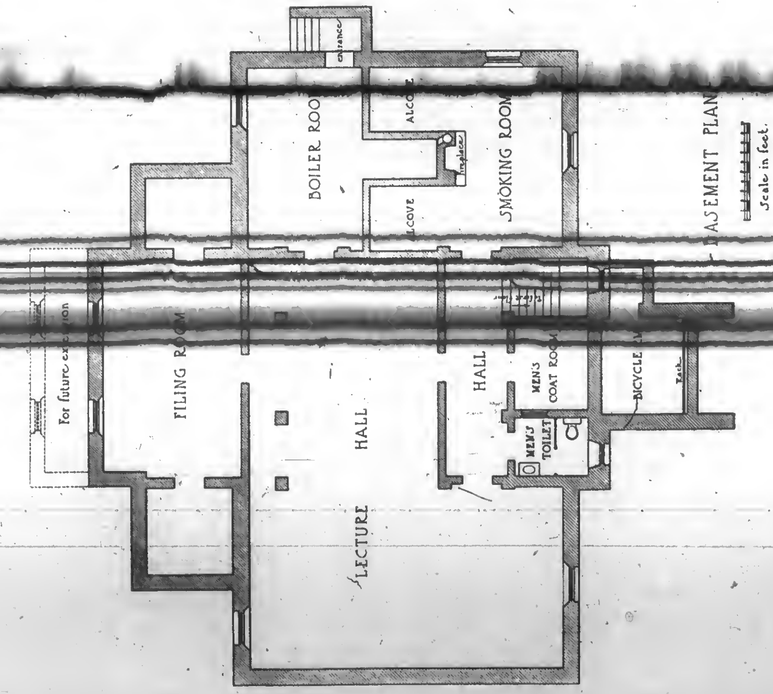


GOLF CLUB, WINNIPEG.

MESSRS. DARLING & PEARSON, ARCHITECTS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1905

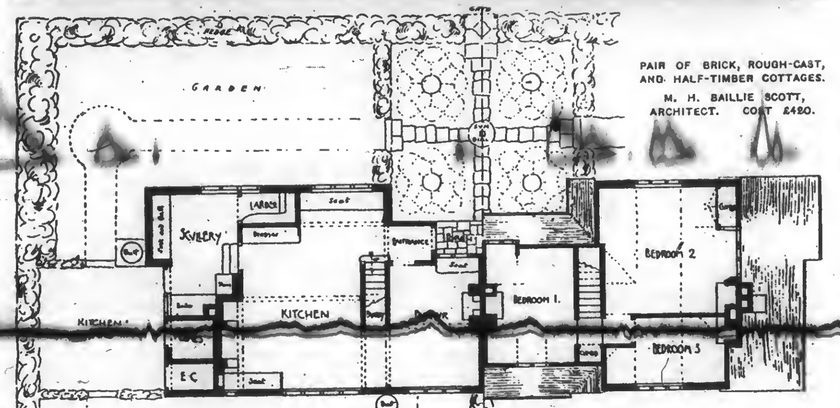




PUBLIC LIBRARY, SARNIA.

MR. M. R. BURROWES, ARCHITECT, SARNIA.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1905



PAIR OF BRICK, ROUGH-CAST, AND HALF-TIMBER COTTAGES.
M. H. BAILLIE SCOTT, ARCHITECT. COST £480.

CHEAP COTTAGES EXHIBITION AT GARDEN CITY.—MR. BAILLIE SCOTT'S DESIGN.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 215. NOVEMBER, 1905.

ILLUSTRATONS ON SHEETS.

The Traders Bank of Canada, Toronto.—Plans and perspective. Messrs. Carrère & Hastings, New York, and Mr. F. S. Baker, Toronto, Associated Architects.

ADDITIONIAL ILLUSTRATIONS IN ARCHITECTS' EDITON.

Strathcona Hall, Montreal.—Messrs. Finley & Spence, Architects, Montreal.
The Royal Bank of Canada, St. Catherines Street Branch.—Messrs. Edward and W. S. Maxwell, Architects, Montreal.

CONTENTS

Editorial	161-122	Montreal Notes	173
Book Notes	162	Sketch Club, P.Q.A.A., Montreal	174-175
The Competition for the Public Library Building at Toronto	163	French Polish	ii
The Tariff on Plans	164	Dew Ponds	iii
Our Illustrations	165	How to Cool a Cellar	iv
The Montreal Building By-Law	166	Maximum Light Glass	ix
The Wrecking of a World's Fair	166	Indestructible Houses	x-xi
The Planning of Decoration	167	Minto House	xii
Axial Planning	168-169	Steam Radiation in a Greenhouse	xii
A Concrete Building in Liverpool	170	To Bring Fresh Air to London	xiii
Costly Public Buildings	170	Porosity and Frost Resistance of Bricks	xiv
Intercommunication	171-172	Steam Curing Concrete Blocks	

The Late Mr. F. E. Kidder.

Frank Eugene Kidder, C. E., the author of the well-known *Pocket Book* for architects and builders, died recently at Denver, Colorado, where he had been obliged to remove from Boston because of the delicacy of his lungs. He was only in his forty-sixth year. The *Pocket Book*, which has reached a twenty-fourth edition, was first published [illegible] twenty-four. His other important work, *Building Construction and Superintendence*, is almost as well known. He wrote also a work on "*Churches and Chapels*," and many articles in architectural and engineering periodicals. His attitude towards construction and design was not so much critical as observant. [illegible] done in American building practice and how to do them well in this manner. He was not a guide to design, but the inventive designer can hardly adopt a safer ground of study than the methods of practice described in his books. There is always a reason at the bottom of vernacular design which is likely to be an essential condition of practical work now, and a thorough understanding of these reasons is the only safe point of departure for invention.

The Sex of Angels.

In the models for sculptured decoration for the Belmont Chapel of the Cathedral of St. John the Divine in New York, the conception of angels came near becoming Americanized by all the angelic figures being represented as feminine. This is but another example of the failure of the modern world to catch the spirit of the early workmen upon whose designs their own work is founded. For the modern decorative artist—average sensual man with a creed of art for art's sake—angels have taken a place among the abstract ideas that furnish an excuse to decorators for modelling the female form. He has lost any sense of their reality and probably does not know that there is any approach to accurate knowledge about them. As far as this knowledge goes it at any rate offers no occasion for a feminine conception, for angels in the Bible are invariably spoken of as "he." But the assurance that in neither marrying nor being given in marriage in heaven we shall be "like the angels" [illegible] necessity of sex, so that the masculine pronoun is applied to the angels only as the word "man" is used when we speak generically of the human race. In this respect it is noteworthy that the angels of Fra Angelico, to whom angels were a reality and their representation a work of devotion, have been known to divide an [illegible] upon the question of their sex; part thinking them masculine [illegible] they are neither. The believing mind of the painter produced [illegible] the angels in heaven." And until the painters and sculptors of our generation can approach the subject with a like faith and reverence, the theme of angels as a subject for decoration is best let alone.

The Metallic Roofing Company Case Concluded.

This case, the first of its kind tried in a Canadian court, dates back to 1902, when the Metallic Roofing Company refused to sign an agreement submitted by the union because it contained a clause that no non-union workman should be employed by the company unless the union was unable to supply union men. Committees representing both parties discussed the matter, but were unable to reach an amicable settlement. Then the union proceeded to organize a boycott against the company by sending circulars to its customers, "stating," as the newspaper report mildly puts it, "that the firm was unfair to organized labour." What was accomplished by the circulars was, in the terms of the judge's charge to the jury, a conspiracy

by threats and intimidation to induce the plaintiff's customers, who would otherwise have dealt with the plaintiffs, to refrain from dealing with them. For this, and for (in the judge's terms again) wrongfully and maliciously coercing the workmen of the company to leave its employment, the defendants were condemned to pay damages to the company, which damages were assessed at $7,500. The interest of the case lies in the fact that the defendants were two union bodies, viz., Local Union No. 30, which declared the strike, and the International Sheet Metal Workers' Union, which endorsed it. It was distinctly stated by the jury, in answer to a question from the judge, that they could not tell from the evidence whether any of the company's workmen who were members of the union voted for the resolution which declared the strike. The damage was caused by the bodies acting in their corporate capacity and is to be paid for out of corporate funds which it was formerly thought were not attachable. The offence against the law was in bringing pressure to bear by means of the boycott. The law permits persuasion but not force.

Combines and the Law.

One may not say anything about the Master Plumbers' Association of Canada, while it is in court. It is charged with conspiring to restrain trade, but nothing is yet proved. Indeed there is danger of unlawfully prejudging almost any trade, by associating it by name with the inflation of building prices, for as the County Crown Attorney has thought fit to seize the books of an accountant in Toronto, who has acted for several bodies, it is not possible to say on which body his hand may not be laid—excepting, perhaps, the plasterers who are said to have burned their books. But it is not necessary to be specific. There is a condition in building affairs which is not sufficiently, it is something in the air, we do not know exactly what it is, we only know what it does, and that when uncontrolled it is deadly. It is a condition which is upsetting the equality of Canadians in trade, making some the slaves of others, and it is therefore contrary to the intention of the law. It is a matter for congratulation that, as the evil has grown, the courts have been able to support injured persons who have appealed to them, and that the agents of the law have been active to arraign those who have suspected of [illegible] carrying out grasping methods of trade. But it must be remembered that the agents of the law are not concerned with questions of abstract right and wrong. Their concern is only with the law; and, if a wrong once becomes a matter of law, there is no redress while the law lasts. It is legislators who have to consider the questions of right and wrong that enter into statutory law; and it is at this stage that the country should see that no wrong is done; that there is no legislation for the advantage of one part of the community over another part. If either capital, trade, or labour seeks strength in union, we must look to it that the law permits none to have advantage over others; that, both in what it favours and in what it restrains, the law which bears upon this question provides alike for all. If there is to be strife between different classes and callings in the community let it be in advance of law-making—at the polls and in parliament—that we may keep class legislation out of this country.

Antiquity of Plumbers.

This note, which has no connection with that above, is suggested by no more serious question than the historical speculations of an English newspaper, which, commenting upon the list of trades represented at the Trades Union Congress, said that "Shakespeare would have been puzzled by a plumber." Would he? Plumbing as we understand it is a modern conception, but the plumber, in the primary and Pickwickian sense of a worker in lead, is no new idea. The French nobility, before the Revolution restrained their natural liberties, used, as they came home from the chase, to shoot plumbers, for the pleasure of seeing them fall off the roof. We are not to suppose that these were members of the union, constantly engaged in running soil-pipes through the roof. The roof itself was their care, which was covered or flashed with lead. But the plumber, in the more familiar capacity of a solderer of water pipes, is as old at any rate as the Roman Empire. In the museum at Arles in the South of France, which was a Roman colony, is a piece of lead pipe, exactly like the seamed lead pipe which, as met with in old houses to be altered, is within the experience of architects of the present day, who have been practising for not more than twenty years. The pipe is said to have been taken from a Roman aqueduct, and bears the evidence of its genuineness in a trade mark, stamped on the pipe, which, as copied into the writer's sketch book, reads SCANTIUS+POIHINUS+FAC.—Scantius Poihinus makr. How near that trade mark seems to bring the pipe to modern times, and reminds us that the citizen of the Roman Empire, except that he did not wear trousers and his science was not sound, was a very modern person, and Rome in those days not unlike New York. Among other points of resemblance which bring it nearer to our own days than to those of Shakespeare, there was the distribution of heat, it is said, but certainly water in the villas of her millionaires; and, if we may trust the evidence of the museum at Arles, the distribution of water was done by means of lead pipe—put in by a plumber.

BOOK NOTICE.

ARCHITECT, OWNER AND BUILDER BEFORE THE LAW, BY T. M. CLARK, F.A.I.A. PUBLISHED BY THE M[illegible], NEW YORK. AGENTS FOR CANADA, MORANG & CO., TORONTO. PRICE $3.00. This volume, written, like Mr. T. M. Clark's other books, in a clear and interesting manner, gives an account of the relation between the architect and the owner, the architect and the builder, and the builder and the owner, as laid down in the decisions of some eight hundred cases in American, English, French and, (in two cases), Canadian courts. The complications that may arise in these different relations are described and the view likely to be taken by the law illustrated by stories of cases which make interesting; and, though the majority of the cases are American, useful reading; likely to keep a man not only out of court but out of the trouble that leads to court. This is the best use that could be made of the book—to read it and get business experience from other people's trouble instead of from one's own. For the purpose of reference the book has an index of the points considered and a double index of the cases cited; giving them in alphabetical order, first as a whole and a second time according to the countries or states in which the case was heard.

THE COMPETITION FOR THE PUBLIC LIBRARY BUILDING AT TORONTO

The programme of the above competition was issued to architects on the last day of October and contains many commendable requirements as well as some that are otherwise.

There is a possibility that the winner of the 1st prize may fare worse than the winners of the 2nd, 3rd and 4th prizes. They stand a fighting chance of earning at least some return towards the cost of the preparation of their designs, while the winner of the first prize gets nothing whatever if his design exceeds the prescribed limit of cost. Before this can be determined he will be compelled to go to the further trouble and expense of preparing full working drawings and specifications, which, to compass the full cost will have to include specifications for plumbing, heating, lighting and book stacks.

The amount of the prize money seems inadequate to the work involved, $350 being the second prize, $250 the third and $150 the fourth—the work going to the winner of the first prize. It is a question if, under the strict conditions and the great possibility that the winner of the first prize will have his work for nothing, a larger number of architects would not have competed if a first prize of say $800 to $1000 had been offered, with the condition that if the work were carried out from his design, the prize money would be merged in the commission.

The competition is restricted to bona fide residents who have been practising "their profession in Canada at least six months prior to this day."

The words "this day" are somewhat ambiguous but as the only date in the programme is that set for the reception of the designs, (July 31st, 1906) it may be presumed that this is the day referred to.

As there is but a nominal duty on foreign plans, and as no Canadian architect residing at home may practice his profession in the United States, the above provision seems eminently just.

The composition of the Board of Judges [illegible] criticism in that but three out of the six may lay any claim to be [illegible]

It is difficult to see what qualifications the Mayor [illegible] (as holding such offices) that should especially fit them for the position of judges in a purely architectural problem.

It is eminently fit that the Chief Librarian should be on the board on account of his knowledge of the requirements of the building and that the City Architect should be there to represent the city's interest, but it seems incomprehensible that the other members of the Board of Judges should be any other than men of recognized architectural knowledge and ability.

It is true that the five men above mentioned are to elect a sixth judge, who shall be an architect, but, unless those who may be termed "lay members" are prepared to accept the judgement of the professional members as to the best designs, there may be either a deadlock or the selection of a design lacking proper architectural merit.

A meretricious design may capture these lay members who may be led away with something showy or catchy while passing by designs of quite scholarly excellence, the difference being understood only by men trained to understand from the drawings what the completed effect will be.

The Board is to be commended in strictly limiting the number and character of the drawings, thus greatly reducing the amount of work required of the competing architects as compared with many competitions of this kind.

The limit of cost, $260,000.00, is likely to prove the greatest stumbling block in the way of intending competitors. The sum is so manifestly inadequate that busy men at all events will hesitate before deciding to spend precious time on that which may prove a fiasco as far as they are concerned.

Those who drew up the terms appear to have been doubtful as to the sufficiency of the amount when they admitted that it is "Manifestly impossible to secure in competition a design carefully studied out and perfected in all details and capable of execution at a *definite point of cost.*"

About the only way of arriving at an approximate estimate of the cost of the building without previously drawing the plans and sections is by cubing the required contents of the building and allowing a percentage for the necessary halls, corridors, etc., with allowance for the thickness of the walls and partitions.

An examination of a large number of plans of similar buildings discloses the fact that from thirty to forty per cent. of the total floor area is occupied by halls, corridors, etc.

If only thirty per cent. is allowed in the Toronto building, the Main building will contain not far from 965,000 and the Stack building 184,000 cubic feet.

To bring the structure within the appropriation, the [illegible] building will, based on the above figures, have to be erected at a cost of 22cts. and the Stack building at a cost of 19cts. per cubic foot, figures which are manifestly absurd when all the requirements are taken into consideration.

These requirements cover a construction of brick, [illegible] terra cotta and a building thoroughly fireproof [illegible] works' salary are also to be included in the total cost.

The new Art Gallery on the grounds of the Exhi[illegible] contains but a single floor, and has no fittings, no heating, and practically no plumbing, while the cornices and frieze are of galvanized sheet iron.

Can the Stack room of a first class Public Library, with its iron stacks and floors, and its heating, be erected for three cents, and the Main building with its numerous rooms, its staircases, lavatories, heating, lighting and other etceteras for six cents more than this gallery?

The proposition seems entirely untenable.

The Main building will doubtless cost 30cts. and the Stack room 25cts. per cubic foot, running up the cost, with architects' fees and clerk of works' salary, to about $353,000.00.

How is the first-prize man going to get around the difficulty?

The Board told the protesting committee of architects that $250,000.00 was enough, but evidently not feeling too sure added another $10,000.00 and virtually guaranteed the $260,000.00 to be a sufficient sum for the purpose.

The architect aspiring to be a prize-man has there

fore to see to it, without cavil or gainsay, that his building can be erected for the money.

If he cannot afford a stone cornice and frieze he will have to be content with that most detestable of all materials, galvanized sheet iron. If the roof is flat it will have to be of felt and gravel at $4.00 per square of 100 feet.

His pilasters and quoins will have to be of brick or artificial stone; his fireproofing will have to be of metal, lath and plaster; his trim will have to be of cheap wood; his plaster without enrichment; his glass, sheet instead of plate; his floors, cement instead of tile, and everything starved to a similar scale.

So long as his plan is suitable and the design good who can say him nay—the Board has decreed it.

Then, if the Board wishes anything better, when the working plans are ordered will be the time for him to take a firm stand—if he does not, he is lost.

It will be the time for him to insist on a waiving of the conditions as to limit of cost to the extent of any additional cost which may be involved by the suggested changes. The other alternative will be to blindly take the risk, design a good building, specify good material and trust to fortune (and the Board) with the hope of an increased appropriation.

The Board has agreed to furnish a Clerk of Works, the usual thing, but it should be clearly understood that he shall be nominated and directed by the architect in order to make sure of a competent man, and one who shall work in harmony with him.

The eleven "suggestions" at the end of the programme including instruction to "provide telephone connection throughout" and "alarm bells for emergencies and routine [illegible]" have an amateurish smack, and would be more in order as instructions to the successful architect when preparing his working [illegible].

We look forward to an interesting sequel to this Competition.

The work may go to a man who will be able to persuade the Board to find additional funds for a suitable building or it may go to a man who will simply give what is asked for, to the lasting regret of all who have desired to see a building worthy of the purpose, the site, and the City.

THE TARIFF ON PLANS.

The [illegible] Commission in Toronto, on November 14th, gave an opportunity to the Ontario Assocation of Architects and the Architectural Eighteen Club to express themselves on the subject of the reason why a duty should be collected on foreign plans and what should be the basis of the tariff. Foreign plans of course means plans from the United States; and the reason why architects in general want a duty to be placed upon them is that the United States is entirely closed to Canadian architects, and practitioners on the border are in the position of being exposed by their own government to the attacks of a foreigner whose government effectually protects him from retaliation. In the large cities it is the prestige of New York that is the trouble. The promoters of anything larger than usual are not happy unless they have a New York or Chicago architect; and the architects of Montreal and Toronto think that this process ought to be made to cost something, so that it may not be lightly adopted or extended unduly downward in the scale of work.

The deputation of architects presented the following memorandum:

NOVEMBER, 14TH, 1905.

To the Hon. W. S. Fielding, Chairman Tariff Commission.

SIR:—The Ontario Association of Architects and the Toronto Architectural Eighteen Club beg respectfully to call your attention to the injustice done to Canadian Architects by the present tariff on Architectural drawings. Prior to December, 1901, the duty on drawings, coming into Canada from the United States was as follows:

"Each set of original drawings, or single set of blue prints of same if brought into Canada as a substitute for the original drawings, 2% of the estimated cost of the building to be erected thereon."

"Same, if accompanied by details, 3% of such estimated cost."

"Details or blue prints of same, if imported separately 1% of the estimated cost of such detail."

"When additional sets of blue prints of the same set of drawings are imported, such additional sets of blue prints are to be valued for duty at $5.00 per set in addition to the value of the original drawings or first set of blue prints imported in lieu thereof, as above."

This schedule was cancelled after the above date, for what reason we are unable to state.

The duty as now in force is practically nominal, being a charge upon the value of the paper only, and the time spent in making copies, such as blue prints.

As an evidence of the unreasonableness of the present tariff and the hardship inflicted on Canadian architects, American architects may erect expensive buildings in Canada, having had the draughting done in the United States, whereas Canadian architects are practically [illegible] carrying on work in the United States under any condition by reason of the duty and the alien labor law.

We would suggest a tariff as follows:

Each set of original drawings or single set of copies or blue prints of same, if brought into Canada as a substitute for the original drawings 40% of the architects fee.—The architect's fee being at 2½% on the estimated cost of the building—for working drawings and specifications. The same if a [illegible] details or for full details afterwards furnished fee of 1% on the estimated cost of the [illegible].

When additional sets of copies or blue prints of the same set of drawings are imported, such additional sets of copies or blue prints are to be valued for duty at $5.00 per set in addition to the value of the original drawings, copies or blue prints. A declaration to be taken that such sets are merely duplicates of drawings or copies or blue prints already imported.

The following is a comparison of the 1901 and the suggested schedule, as they would work on a $100,000.00 building*:—

THE 1901 SCHEDULE.

Cost of building ($100,000.00) [illegible]

THE SUGGESTED SCHEDULE.

1% on cost of building ($100,000.00) [illegible]

Duty as above by a rating of 40% on the architect's fee which should be put at 2½% on the cost of the building for plans and specifications (Example) the duty on a building costing $100,000.00 would be, architect's fee at 2½%, $2,500.00, and a duty of 40% on such fee would be..... $1,000.00

For detail drawings the architect's fee should be put at 1% on the cost of the building .....

(Example) the fee on details of a building costing $100,000.00 would be 1% on $100,000.00 or $1,000.00 and a duty of 40% on such fee would be $ 400.00

Note.—The present duty on drawings of a $100,000.00 building is the nominal sum of say..... $ 5.00

This is a logical way of getting at the case. The importation is the architect's services. This is what the owner has purchased and the purchasing price should be the ba[illegible]s for the estimation of customs duty. The drawings ar[illegible] "but instruments of service," and the service is not [illegible]hat of the office boy who prints them but that of the architect who owns and uses them in carrying out the s[illegible]rvice for which he is paid—the production of a house.

* It should be noted that the proposal is to collect only half of the 1901 tariff, which was thought too high.

OUR ILLUSTRATIONS.

THE ROYAL BANK OF CANADA, BRANCH ON ST. CATHERINE STREET, MONTREAL. MESSRS. EDWARD AND W. S. MAXWELL, ARHITECTS, MONTREAL.

The photograph we have received can hardly do justice to the peculiar character of this building with its necessary contrasts of colour. Viewed through a magnifying glass, so as to get the appearance from the point of view of a passenger on the street, the front is not only novel and interesting but pleasing. We should question however, first, the desirability of cutting the wall down so low beside the doorway, (it appears to be more than is actually convenient, if one may judge from the curtains that have been strung across the opening at a height of about six feet above the step which runs past the door), and, secondly, the curved lines of the door abutments seem hardly severe enough for their position at the base of the building. Doubtless the subsidiary position of the doorway, as a feature within the structural opening, suggested their form, and they were intended to connect the doorway with the base line; but they might reasonably have been higher, as high as the curtain at least, and, if severely rectangular, could be made none the less interstitial by treatment.

TRATHCONA HALL, MONTREAL.—MESSRS. FINLEY & SPENCE, MONTREAL, ARCHITECTS.

The McGill University branch of the Y.M.C.A. have erected this building as a residential club for students of the University. There are rooms for about 60 students, besides dining and recreation rooms. The building is on the corner of Sherbrooke street and McGill College avenue, facing the University grounds and nearly opposite to the principal entrance gate. The [illegible] Sherbrooke street is of yellow sandstone, the side wall on McGill College avenue is of brick, to match the stone on the front, and combined with it by means of string courses of stone running with the heads and sills of the club-rooms as far as they extend. It is the external manifestation of the internal arrangement which gives the design its severity in the upper storeys. Below we have the [illegible] bedroom floors, which get their proper representation on the facade. Above, all is of a private and simple nature [illegible] (though [illegible] pierced do not announce that fact) and without predominant motive, for one bedroom does not differ from another bedroom in glory. The upper part is therefore properly plain. But it is not entirely satisfactory. The law that the more severe should be below the more elegant is as inexorable as the law of gravity, and this design suffers from the insertion of those graceful round headed windows, (which should be at the top of something), as the supporting members of the piles of square headed windows which belong to the bedrooms. As the round heads do not appear within the room of the principal storey there is no apparent objection to crowning the double storey of club-rooms emphatically, with a string cornice, and slipping the main cornice up to the top of the building; which seems its proper position, (if the external presentation of internal arrangement is to be carried out consistently), for it hardly seems possible that all the 60 bedrooms are below the attic and, if they are not, there is no reason to mark off the upper storey as inferior. Then the cornice would be in a position to receive graceful treatment to any extent that was necessary to duly adjust the whole design to the law that the most elegant should be uppermost.

There seems, however, to be some complexity of level, shown in the fenestration of the two lower storeys on McGill College avenue, which was probably at the bottom of the present arrangement of the composition.

THE TRADERS BANK OF CANADA, TORONTO.—MESSRS. CARRERE & HASTINGS, NEW YORK, AND F. S. BAKER, TORONTO, ASSOCIATED ARCHITECTS.

We cannot regard the arrival of the tall building in Toronto with entire satisfaction, but it is at any rate satisfactory that the first—for this is the root of dissatisfaction, that it will not remain long alone, so susceptible to public approbation are the banks—it is satisfactory to have at least a good example to begin with.

The plan, which devotes the first and second floors to the bank offices, making of them a two-storeyed chamber, is exactly represented on the exterior, giving the bank offices distinction both externally and internally in the same manner. The elevation of the banking room above the street is new in Toronto, but it helps to serve the problem, how to get the public into the middle of the floor space, and keep the clerks in unbroken connection on the outside where the light is. The entry most in use will be no doubt be that from the elevator hall, so that the connection on the ground floor will be still interrupted to some extent but the fact of the other entrance makes for the reduction of the entrance from the hall. The flight of steps (there are only 22) will be the most convenient [illegible] bank entrance on the street, which is an exterior essential, gets thereby a justification in plan. The rest of the exterior is admirable. The limestone base, formed by the ground floor and the bank double-floor with its emphatic Doric order is terminated by a terra-cotta cornice, not of the light character shown by the artist in the perspective drawing, but a cornice of ordinary classic proportion, surmounted [illegible] gracefully eased into the shaft of the building by the pedimented tops to alternate windows of the [illegible] the base in composition by continuing up the solider corners as a mass more solid and more perpendicular than the rest of the building. The effect of solidity, (which is obtained by projecting the wall slightly for about 17 ft. from the corners and by rusticating the brickwork with a recessed course at intervals of about a foot), and the effect of perpendicularity, (which comes chiefly from banding the central portion of the wall at intervals with strings which stop against the projecting corners), gives the corners a value in composition equivalent to that of quoins on a large scale, or of pilasters; giving the corners a firm appearance. The large cornice at the top projects fully 6 feet, and will be, (alas!), copper; covering, however, a steel construction which will make of the cornice a practicable gallery with a view over the lake. A virtue of this projecting cornice for the people of Toronto is that it will reduce the building in appearance to a twelve storey building; for the thirteenth storey is contained in the cornice, and everything above, if it appears at [illegible], will count as roof.

THE MONTREAL BUILDING BY-LAW.

The recent amendments to the Montreal Building By-law, 1901, were published in the Municipal Gazette of the city of 9th October, 1905. The complete By-law in its revised form is in preparation, but has not yet been issued.

The amendments naturally take the form of improvements, and, if everything is not yet as perfect as it may be hoped some day to be, yet all such real improvements as have been made must be hailed with satisfaction. The principal alterations and extensions are made with a view to improving the fire-proof quality of buildings, especially those of the first class—theatres receiving most attention. The sections relating to the strength of beams and columns of steel, iron and wood have been revised, the ultimate stress required as a minimum being considerably raised for nearly every material. The raising of the compressional and tensional strength of rolled steel, from a minimum of 48,000 pounds per square inch to that of 64,000 pounds per square inch, is a considerable difference but still not an overstringent requirement.

For bricks the requirement still stands "the bricks used in all buildings shall be good, hard, well burnt bricks," in spite of the circumstance that at the present moment large quantities of bricks are being used which are not burnt at all. If they are suitable for building, there should be some space allowed for such materials in the by-law. It is now provided that "when the thermometer is at or below freezing point, hydraulic cement shall be used in the composition of mortar for brickwork." This is the more essential by reason that the somewhat easy terms allowed for bond in brickwork are in the ordinary practice of the city much honoured in the breach, and that the quality of the mortar is of the greater importance. [illegible] re-inforced concrete as a wall material seems to be still unprovided for in the regulations, though perhaps not necessarily debarred.

The question of fire-proofing has, as already stated, been given most consideration. The materials which are to be considered as fulfilling the conditions of fire-proof coverings are defined as: First, brick; second, hollow tiles or burnt clay (terra cotta) [illegible] as incombustible, applied to the metal structure according to a stated method; third, porous terra cotta of prescribed thickness [illegible] cement concrete not less than 1½ in. thick. Cinder concrete is disallowed, unless treated so as to be free from material which would render it combustible at a temperature of less than 1,500 degrees Fahrenheit.

To the clauses which regulate the construction of theatres a number more have been added, and, as they contradict existing clauses in many respects, it is to be hoped that, when the by-laws are printed in amended form, it will be quite clear that these revised clauses take entire precedence of the others. Thus the new clauses provide for doors with "no locks of any kind"; whilst the actual clauses, which presumably are still to remain part of the by-law, call for fastenings upon the inside only. The new clauses take 20 inches of width for each 100 permanent seats of the auditorium as the basis for regulating the width of exits. The old clauses gave eighteen inches per 100 seats as the basis, and it will be necessary to revise these provisions wherever they are mentioned. As regards width of aisles between seats, the old law made better provision than the new one does. The spacing of seating is now for the first time defined:—"Seats shall not be less than twenty inches in width, measured at the top of the seat; back rows of seats shall not be less than two feet six inches from back to back. No more than 12 seats shall be arranged in any one row between aisles; no more than 5 seats shall be arranged in any one row between one aisle and the wall," etc. Nothing is said of continuous seating however.

A good provision now introduced is that the staircases of theatres shall have an independent lighting system of electricity, gas or sperm oil. It is regrettable that the conditions as to staircases remain meagre and unsatisfactory. In assembly-halls, hotels, etc., they must be enclosed by walls on three sides, but there is no such requirement for theatre staircases, though this and more is absolutely essential to public safety. In more than one of the best theatres in Montreal the public habitually enter and leave the dress circle or balcony by an open stair at the back of the ground floor auditorium; the other exits being perilous looking external iron fire-escapes. Theatre stairs should all be built around on four sides surely. The stairs themselves are permitted to have hardwood treads, and, as no thickness is specified, nor anything said about bedding these down on concrete, a thoroughly dangerous stair may comply with the requirements.

The standard of equipment, in case of fire breaking out, has been very much raised.

In describing fire escapes, the words "cloth or metal tubes" might with advantage be omitted, leaving "or other means of egress . . . as may be approved of . . . . . by the Inspector" to cover special cases.

A by-law concerning the erection of buildings in St. Catherine street aims at the improvement in character of buildings in this important thoroughfare and insists on frontages of solid and incombustible character. The requirement that "the new buildings shall not have less than thirty-eight feet from the sidewalk to the top of the roof" ought obviously to be enforced with consider[illegible]

THE WRECKING OF A WORLD'S [illegible]

[illegible] or demolishing the splendid buildings at the Louisiana Purchase Exposition is a colossal task, as indicated by the amount of material collected by the company which purchased the structures from the fair management. In a list sent out to prospective purchasers of the material no less than 100,000,000 feet of lumber is offered for sale, comprising every kind and description, 50,000 sash, 10,000 doors, together with one million dollars' worth of copper wire, and other electrical material, vast quantities of pipe, fencing, roofing material, furniture, in fact, an aggregation of second hand goods such as never before was placed on the market. A novel feature is the offering of 25,000 bamboo poles used by the government in the Philippine Reservation, the last memento of the man-eating natives of Uncle Sam's new possession. It would be interesting to know where all of this material will find its destination. One may imagine that some of it may go to dwellings in the west, the other parts of it may do service in the east, and still others in the south and in the north, distributing to all parts of the country souvenirs in the shape of building material from this greatest of modern expositions.—*The Ohio Architect and Builder.*

THE PLANNING OF DECORATION.

General Analysis: Architecture is primarily proportioned construction, so that the first duty of the ornament which is associated with it is that the expression of the construction should not be denied or violated; and as construction is made up of a number of parts, the ornament naturally accents those parts and their combinations. A building has mass, stability and focus. Its mass is expressed by its surface, its stability by its perpendicular and horizontal lines, its focus either by its axis, its largest unit or both. As it is made up of a number of integral parts or cells, the parts must correlate and group about one another, usually with the smaller units about the larger. These groups form stratifications and axes, and it will be found that a large proportion of the ornament applied to architecture is devoted to accenting these stratifications and axes. All decoration of string and belt courses and entablatures belong to the stratified type, while decorations of columns, pilasters, piers, mullions and many of the terminal forms belong to the type upon axes.

The decoration of the surface of a building is of minor consideration, and is merely to give scale, tone, or color to the mass. As a building is made up of cells, the main axis of each cell is its centre line, and therefore upon a void and not upon a solid or wall line; and because of this fact, and also that all architecture has grown either from the single cell or from a group of cells about the central one, the main axis of the majority of buildings is upon a void, not upon a solid; and as walls are above walls and cells above cells in ordinary construction, voids come naturally above voids, and openings are over openings on the same axis. So much is this the custom, and so long has it been felt to be an expression of stability which it is unwise to violate, that the axiom, solids above solids and voids above voids, has become universal in architectural design as far as construction will permit. When, as in the Ducal Palace in Venice or in the arcaded streets of Bologna, plain walls with comparatively small openings are carried upon [illegible] columns and lintel carrying such walls are given strong and vigorous treatment and the walls above as light a treatment as possible, either by texture or by delicacy of detail; and this is the mere common sense of design expressing stability. As far as stratification of exterior is concerned, the wall is divided into storeys and has a crown or termination, and ornament is associated with belt courses and cornices.

[illegible] upon the exterior of a building is the decoration of the broad surfaces, which in most cases are best left plain. If however, for purposes [illegible] colour these [illegible] pattern, either a diaper or of parallel bands or forms suggested by the material of which the surface is built; for instance, if of brick the patterns are based on checkers or are stratified; if of stone, they accent each stone at either horizontal or perpendicular joints, or both; if of shingles or other lapped covering of small pieces, scale patterns are suggested. The most prolific motives are those of the so-called rustication of stones in which each joint is moulded, and borders are carried around the edges of the stones; the wall may also be stratified by projections and mouldings. The surface patterns upon the stones should be small in scale and even in tone.

Floor treatment. Floor patterns should be in one level plane, giving no impression by form, tone or colour of depression or projection. For this reason strong contrasts of tones, unless in very small scale, should be avoided, as should also all marked impressions of overlap, interlace or embossing. As many of the Oriental patterns are entirely free from these qualities they are peculiarly adaptable to floor designs.

In cases where the floor is entire it requires its principal ornament around its edge as a border to define it from the wall. Manifestly a floor should not appear to sink or to be depressed at its centre; on the contrary, it is better to have the impression of its being crowned at the centre; and as dark tones retreat, the border, rather than the centre of the floor, should be the darker either in tone or by amount of detail.

As the floor is under foot, and as all ornament is less noticeable below than above the eye, elaborate systems of floor decoration are labor thrown away; the true purpose of the decoration of a floor being that of a foil to the remainder of the room. The ornament, therefore, should be less conspicuous and smaller in scale than that on the walls, and as the floor is seen more in perspective than either the walls or the ceiling, involved or complicated designs upon it become confused; simple geometric systems of planning being much more satisfactory.

Wall treatment. In the decoration of a wall the usual effect of horizontal bands or zones is to lower the wall and to lengthen it; and this fact more than any other tends to determine the number and proportion of the subdivisions. It is evident that the narrow zones should be toward the top to avoid the appearance of overpowering weight upon and consequent compression of the lower zones, and the same reasoning causes lighter tones and detail at the top than at the bottom. The introduction of minor zones, such as superdados, subfriezes, etc., which appear in Victorian English decoration, is unnecessary and confusing.

The main point of definition being at the base and cornice, each advances rather than retreats, and the base being below the eye receives slight attention, while the cornices become elaborate. The strength of detail, of tone, and of scale diminishes upward to avoid heaviness at the top of the wall; this should not be overlooked.

Panels. The further treatment of walls between the openings is forced into a panelled treatment of greater or less scale; and the wall with the greater number of openings sets the scale for the plain wall with fewer. The panelled treatment may be simple fields with borders as at Pompeii; or divided [illegible] pilasters [illegible] Renaissance interiors; or have marked perpendicular treatment, as in the chateaux on the Loire; the surface may advance and retreat and become most elaborate in modelling and colour; but always the openings and the spaces between them set the scale. It will therefore be found that as these openings are usually higher than they are wide, unless there be a very much greater [illegible] than [illegible] perpendicular rather than horizontal treatment is applicable to most walls of [illegible] the exception being when windows are so grouped that the width of the group exceeds its height, and when openings are insignificant.

The cornice, uninterrupted by openings, defines the wall from the ceiling, and therefore projects at a greater or less angle. At times it is coved, carrying the wall surface over into the ceiling surface, in which case the cove is the dominant of the group of mouldings forming the cornice. If the ceiling is enriched the cornice becomes heavier in proportion to the enrichment upon the ceiling, unless the latter be frankly of panelled beams which are carried on the top of the wall, in which case the cornice is not necessary.

As the cornice is in most cases a group of mouldings, and therefore band ornament, it can be treated as a band or belt, while the frieze below it, equally uninterrupted by openings, becomes an excellent field for either contiuous ornament or specialized ornament at regular intervals on axes. Cornices break naturally around projections, but it is superfluous to break them on the runs between projections except to define some axis strongly. Cornices immediately above openings require sufficient depth to appear as supporting beams spanning the opening.

Ceilings. The decoration of ceilings depends very largely upon the importance of the room and its purpose. Usually small rooms require little ornament upon the ceiling. Rooms are naturally of two classes—those which are merely backgrounds for the furniture,

&c., within the room, and those which are complete in themselves and require but few accessories; to the latter type belong the more highly ornamented walls and ceilings. The flat ceilings in one plane are practically large panels defined by the walls, and require panel treatment, *i. e.*, with borders or with centre motives, or both, care being taken that the centre of the ceiling does not appear lower than the sides. To avoid this effect the centre ornament should not have either too much projection, too large a scale or too strong a tone; and it is advisable to have the design of the border more vigorous than that of the centre.

Darker tones in the ceiling than in the walls produce the effect of a heavy ceiling, for which reason, unless there are strong supporting motives in the ceiling, such as beams from wall to wall or rich projecting divisions between panels forming a framework apparently capable of self-support, it is well to have the tone of the ceiling lighter than the wall. This is also dependent upon the apparent carrying capacity of the wall, for walls with deep reveals, indicating thickness, or with high broad surfaces, which also apparently necessitate thickness, or with pilastered or columned treatment, can carry heavier and richer ceilings than thin walls or walls pierced with numerous openings.

BORDERS ON FLAT CEILINGS come immediately in contact with the upper part of the wall, and if undefined from it by cornice lines require careful harmony or treatment with the design upon the wall, having similar intervals of repeat; in fact, the top of the wall, the cornice and the border of the ceiling should always be designed together, not as separate designs. Corners of ceilings, contrary to those of floors, are adaptable points of interest for ornament, though liable to disturb the scale

BEAMS in ceilings must be manifestly deep enough, and of proper intervals apart to carry the floor or roof above; the spaces between the beams becoming panels, subject to panel treatment. Alternation of beams, cross beams and framework patterns produce coffered ceilings of the richest type, the coffers being recessed to greater or less depth at will, and treated in the same or different tones from the framework, which takes the form of a geometric pattern extending over the entire ceiling and dividing it into panels of various shapes. When the framework becomes delicate and of slight projection, it is advisable to keep the tones of the frame and the panel near to each other; the heavier framework allowing greater contrast of tone and colour. Upon the framework, ornament is naturally placed at the juncture of the pieces of frame. Each piece of frame is a band and can be treated as such.

VAULTED CEILINGS are based on arch construction, and the lines of intersection of the arches are the salient lines of ornament being bands or borders strongest in their centre lines and with either in repose or following the lines upward. The spaces between these lines become panels of many forms, the ornament upon them being subordinate in scale or tone to the construction lines; and it is inadvisable to subdivide these panels excepting by some geometric framework or lattice of less strength than the arch lines.

At the points where the arch lines group, rich ornament can properly be placed, such as caps or corbels at the base of the lines; and bosses, rosettes, knots, pendants, &c., at the crown. Parallel bands as borders or arch lines, whether of mouldings or of flat decoration, apparently strengthen the construction; while exceedingly heavy centres in the panels apparently weaken it. Single vaulted ceilings, such as those spanned by barrel-vaults, can be heavily coffered; but all cofferings of ceilings of interlacing arches requires lighter treatment to avoid violating the apparent strength of the rib lines. The tympana left by the barrel-vaults at the end walls of the room are of unique shape and capable of specialized treatment of great interest. Vaulted ceilings do not require a continuous cornice below them, sections of the cornice forming caps or corbels at the points where the arch lines meet the perpendicular walls being sufficient.

PENDANTS. Ceilings with hanging forms or pendants, as at Troyes or at Rosslyn Chapel, and stalactite ceilings, as at the Alhambra, need a strong initial background surface, manifestly capable not only of supporting itself but also all forms hung upon it; and as an arch over a span can unquestionably carry more than a beam over the same span, the ceilings are best when the background is an arched or vaulted form: in fact, pendants from a flat ceiling should be associated with a strong framework pattern upon the ceiling. In all cases numerous small pendants or stalactites are more agreeable than a few large or apparently heavy ones; and the construction scheme should be carefully worked out in the mass before the detail is applied. The form of the pendants should decrease downwards and partake of the character of hanging forms, not of mere masses fastened as a deadweight upon the surface. It is not usual to find such forms at a point of departure for chandeliers, etc., from the midst of a plain surface; and in most cases they are unsatisfactory, the tubing or rods of such fixtures appearing lighter when piercing the heart of a flat ornament, such as a rose or circle. The Oriental stalactite ceilings are extremely interesting; they are built of a series of carefully related units, each of which does its work in supporting those about it.

Pendants from keystones can be heavier than at other points, for obvious reasons.—*The Builders' Journal and Architectural Record.*

AXIAL PLANNING.

It is often said by foreign critics that English architecture lacks the element of study which is so pronounced a characteristic of Continental work. Unfortunately, there is a good deal of truth in this, and to a large extent it is undoubtedly due to our neglect of certain great principles, amongst which that of axial planning is one of the most prominent. Tracing back

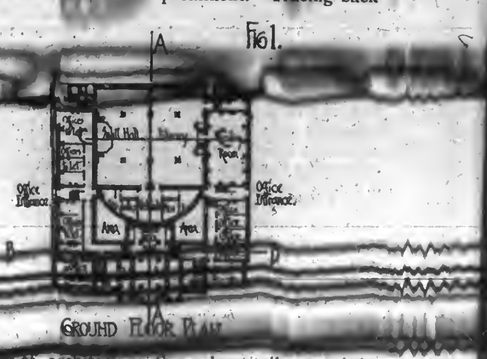
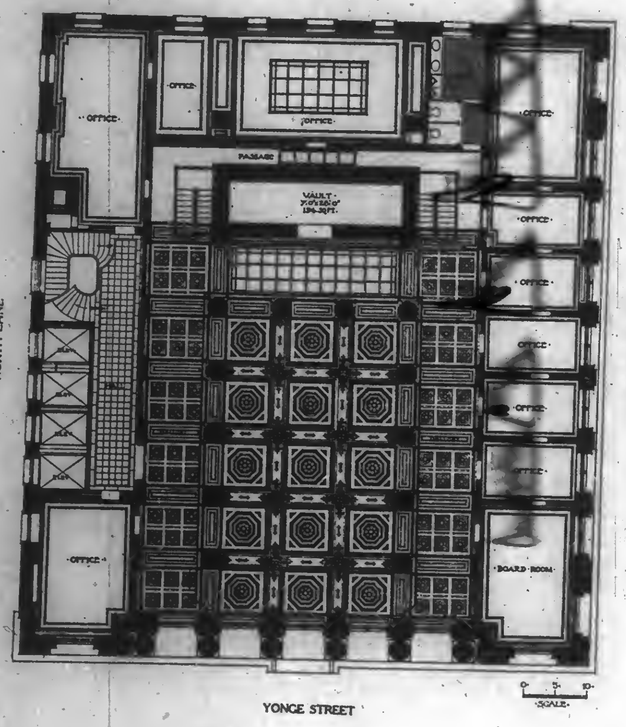


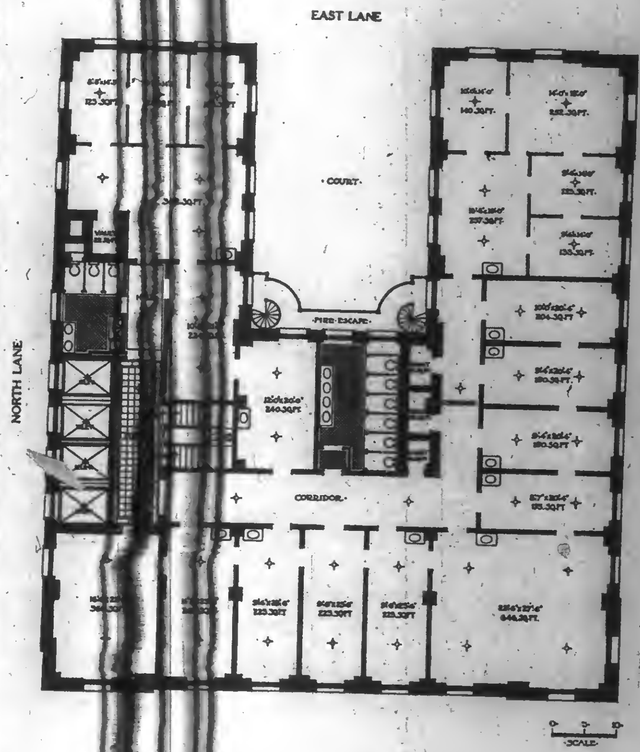
Fig 1.
GROUND FLOOR PLAN

the history of architecture throughout all ages, it is found that this principle predominates, not in one period, but in all, where great schemes are concerned. In the Egyptian works it is in strong evidence, the great temples of Thebes being all arranged with an axial corridor and carefully managed minor axes. The Greek temples are similar, and not the temples alone, but the general building schemes of which they formed a part. Roman work, as we know, is based upon the Greek, in this as in most other respects, and the Renaissance was based upon the Roman. All this is a natural sequence; but the Gothic spirit is so utterly different from that which permeates all Classic types, that it might have been thought that this principle would not govern the great building of the Gothic period; yet the churches at least have the same central axial arrangement as have the Basilicas of Rome or the temples of Greece and Egypt, though, upon military grounds, the castles are differently planned.

There is no gainsaying the fact that the present is a Renaissance period, and it consequently follows that the principles which have been successfully applied to Classic architecture in the past should apply equally



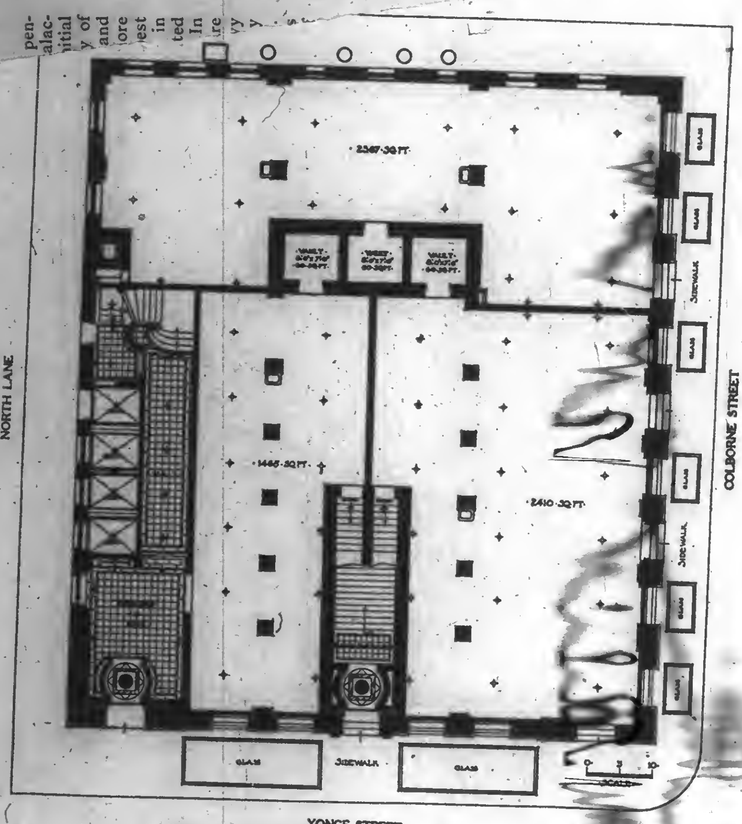
GALLERY FLOOR OF BANK.



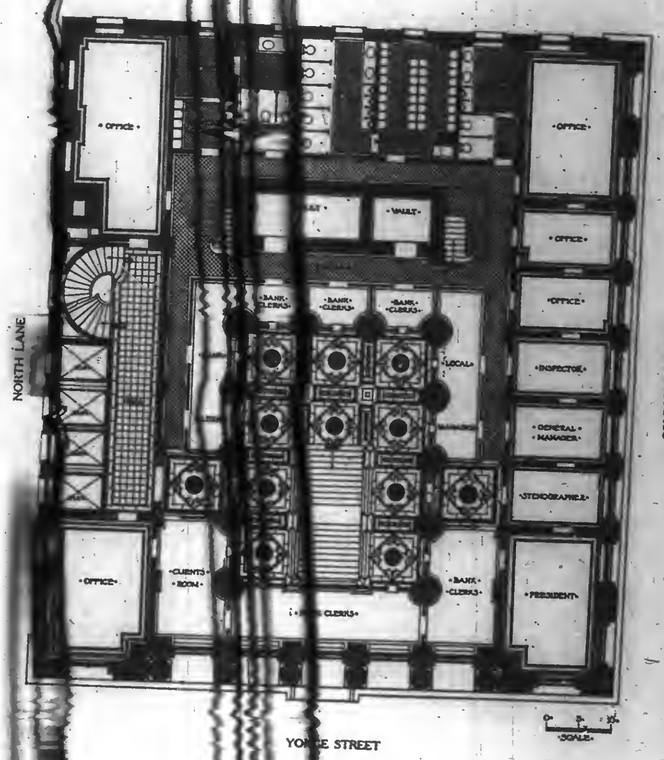
TYPICAL PLAN OF OFFICE FLOORS.

THE TRADERS BANK OF CANADA BUILDING, TORONTO.

CANADIAN ARCHITECT AND BUILDER.



GROUND FLOOR.

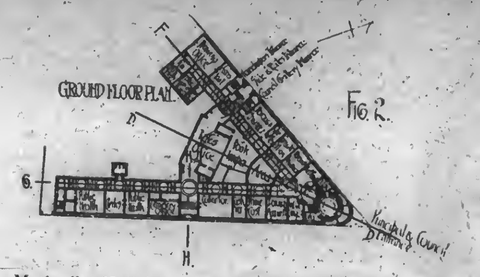


BANKING FLOOR.

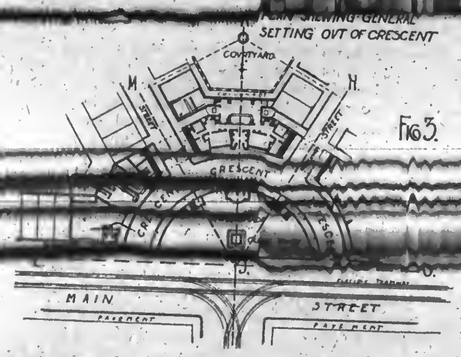
THE TRADERS BANK OF CANADA BUILDING, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER 1905

well to that of the present day. In small works, particularly private houses, we generally plan upon a Gothic system, which has come down to us rather from the castle than from Ecclesiastical architecture. As a result, we build for convenience rather than for dignified effect. In all greater matters, on the other hand, we now adopt some phase of the Renaissance, and it would be well if we were to follow the Continental fashion of basing our plans upon an axial system. Now and again we find that this is done, and always with good effect. This has been shown in a few recent competitions. Mr. Gibson's plan for the Wesleyan



Methodist Hall (Fig. 1) has a central axial line, which is in the form of a corridor from the entrance doorway, until the pair of doors to the small hall and library are met, this axial arrangement being particularly noticeable in the entrance-hall. At the junction of the entrance hall and inner hall the axis is crossed by a secondary axis lettered B B, off which, however, things do not pair so completely as they do off the main axis. When the small hall and library are thrown into one, they form a hall which is again axial in its arrangement, with a wide nave and comparatively wide aisles, this axis C C crossing the major axis A A at right angles. The scheme is a simple one, of a type which may be traced back, as we have already said, to the

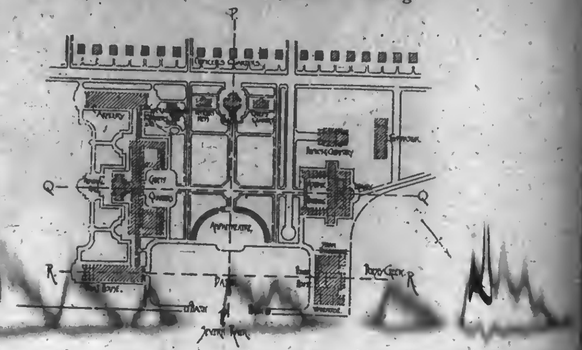


earliest times; but it is as applicable now as it always has been, and is as productive of good effect.

A further developed example is Messrs. Warwick and Hall's successful design for the Lambeth Municipal Offices (Fig. 2). This building occurs at a sharp angle, and the axis is obtained by bisecting this angle, the design being symmetrical, though not identical, on either side of it. The axial corridor only extends from the entrance to an inner hall, and there diverges to corridors on right and left, forming radial axes from the main axis. It will be seen that the major axis is lettered D D, and these two radial axes E F and E G. Of these E G is again crossed at right angles by another axis, H H, which serves to dominate the elevation to Brixton Hill, while a somewhat similar arrangement occurs on the other frontage. The idea of splitting the axis into two divergent axes is by means new; but it is used here with some ability, and in a manner also as highly instructive and well worthy of con-

The plan is thereby rendered something quite different from the usual haphazard schemes submitted in English competitions.

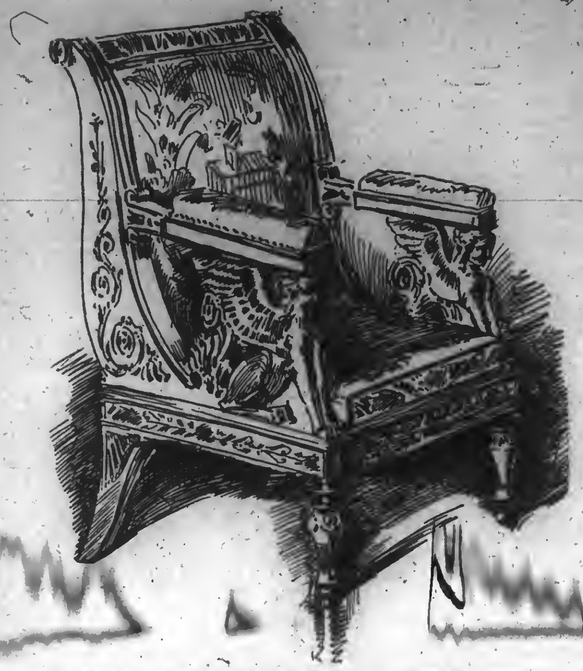
A very similar idea dominated the design for a crescent by which the Tite prize was won in 1903 (Fig. 3). The plan shows a central axial line, J K, off which everything is symmetrically designed; but for the point J there radiate a series of axes J L, J M, J N, and J O passing down various streets clear of obstructions. This is again a case of divergence of axes or radiation, the whole effect being most perfectly visible from the point J; for it may be noted that one of the great advantages of axial arrangement from an architectural point of view is that of obtaining a series of vistas. Convenience is also secured, for it is always easy to find one's way about an axially planned building.



Although these English examples are sufficient to show that the principle of axiality is becoming recognized, yet there is none in which it is so perfectly developed as in Mr. Ernest Flagg's scheme for the United States Naval Academy at Annapolis, illustrated in Fig. 4. This is an almost perfect example of studied [illegible] rules and principles, and may be taken as being typical of modern French work, Mr. Flagg having been educated at the Ecole des Beaux Arts in Paris. The scheme is controlled by two axes P P and Q Q, which cross one another almost centrally at right angles, both of them being rather axial passages than axial lines throughout their whole extent. The planning is not entirely symmetrical off either of them, while each individual building has its own [illegible] axes. There is, for instance, a supplementary axis, R R, which passes through the boat-house, the basin and [illegible] counting only as one of the several minor axes of the cadets' quarters, which is planned as a hall off the great axis Q Q, which serves likewise as the principal axis of the academy building. It would probably cause confusion rather than elucidation if all the many axes were shown upon this plan; but it will be seen that the adoption of axial arrangement, not only in each individual building, but in the relation of building to building, has led to directness and simplicity, and the production of admirable vistas, and this in spite of an irregular site, occasioned by the Dorsey Creek, which would have led many architects to have despaired of producing a formal architectural scheme.

In emphasizing so strongly the need for axial arrangement, if successful planning of big schemes is to result, it is not to be thought that this is the only element tending to success in this direction. It is, however, one of the most important, and one of the most neglected by English architects, while it is one of the first that is insisted upon by the great French masters of the art of planning. No more severe criticism can be passed by one of them than to tell his student that he does not yet know how to lay down an axis. On the other hand, English architects hardly understand this to be a leading necessity, being too much accustomed to deal with small and irregular buildings.

SUPPLEMENT TO CANADIAN ARCHITECT AND BUILDER NOVEMBER, 1905



RIQUET (PAUL-EDMOND), *Etudes de meubles au chateau de Fontainebleau.*

A CONCRETE BUILDING IN LIVERPOOL.

The disposal of the clinker from refuse destructors in Liverpool has been a problem of considerable difficulty for many years. Nine years ago, when Mr. H. Percy Boulnois was city engineer, he used this material as the aggregate for concrete for lintels, windows, sills, doors-steps and similar part dwellings of low cost, but recently his successor, Mr. J. A. Brodie has used the material in a reinforced concrete tenement house. It has been built to prove that satisfactory dwellings for low rentals can be constructed from what is practically a waste material.

About 50,000 tons of clinker are produced annually at Liverpool, and the cost of disposing of the portions [illegible] about 60 cents per ton. At present Mr. Brodie reports, about 15,000 ton are dumped at sea at an even higher cost. The portion of the clinker for which a use is found [illegible] gate in the concrete sidewalk slabs, of which 160,000 sq. yd. have been laid. Recently it has been used for the foundation of pavements and simalar works and in the manufacture of paving blocks for roadways carrying comparatively light traffic. At the best, however, not over a third of the clinker can be put to use by these methods, and accordingly permission was obtained from the Local Government Board two years ago to put up a clinker concrete tenement house, reinforced with a little steel.

The building covers 234 sq. yd. of a plot having 413 sq. yd. It has three storeys, each with four tenements. Each tenement has a separate doorway and is self-contained, and the balconies by which the upper tenements are entered are reached by open stairs from the streets. Each tenement has a 15 × 10⅓ ft. living room, two bedrooms averaging 15¼ × 7¾ ft. and 10 ft., a scullery and a toilet. Gas and water are piped into each tenement, and the living room contains a range and a food cupboard ventilated into the outer air. The bedrooms have grates. The roof is flat and fitted up as a playground and for drying clothes.

The construction of the building is wholly unlike anything attempted in the United States. The ceiling, the floor and each of the four sides are separate concrete slabs, weighing 1 to 11 tons and hauled to the site by a traction engine. The openings for doors, windows and fire-places were made when the windows were manufactured, and mortices and tenons were left at the edges so that all parts would dovetail together. The joints were made with cement mortar, and two 1 in. bolts were used at each vertical joint to hold the parts together while the joint was setting. The balconies, stairs, parapet walls, and chimney tops were molded blocks, and the chimneys and ash chutes were lined with earthenware pipes. Except for a margin around each room, the floors were covered with ¾ in. boards, bedded in a hot pitch mixture and nailed to scantlings set in the concrete.

The slabs were made 14 in. thick as recommended by the Local Government Board, instead of 7 in. as intended by the city engineer. The thick slabs had to be left six to eight days in the molds before they could be moved safely. Some of them met with an accident, and in order not to incur delay by waiting for fresh slabs to season, about half the floors were built of concrete in place, carried by steel beams. The foundations consisted of concrete piers 12 ft. deep carrying flat arches on which the walls were supported. This construction was necessary because the building was erected on a site where a cellared structure formerly stood.

The building was estimated to cost $6,100 but about $20,000 was actually spent, owing to the unnecessary thickness of the walls, extra depth of foundations, troubles with molds, and needless expense for framing and scaffolds. Mr. Brodie is confident that similar buildings can be constructed at his original estimate which is considerably under the cost of like structures [illegible]

From this experience Mr. Brodie is convinced that any size of slab likely to be used for building purposes in Liverpool can be made and erected safely. The largest yet made was 16 × 13 feet. Floor and roof slabs for the building were tested with heavy distributed loads without measurable deflection or appreciable injury, and the strength of the building seems to be beyond question. The [illegible] mortar has proved entirely satisfactory. The buildings are particularly appropriate for low-rental homes, because they are fireproof and can be kept clean with a [illegible] in this type of construction, any reduction in cost depends largely on the possibility of repetition of individual slabs without requiring any alteration of the molds.—*Engineering Record.*

COSTLY PUBLIC BUILDINGS.

The 75 chief cities of America have $100,000,000 invested in city halls. Philadelphia leads with a $27,000,000 city hall, and San Francisco follows with one worth $8,300,000.

After these cities come Boston, with a city hall representing $7,500,000; New York with one standing for $7,000,000, and Baltimore with a $5,000,000 structure and grounds. The value in each case is based upon the value of the city hall itself and the park or grounds surrounding it.

Every American city of more than 300,000 population has at least a million dollar city hall with the exception of New Orleans. St. Louis, Cincinnati and Detroit have buildings worth more than $2,000,000 each. Chicago falls $250,000 below that. Pittsburg and Milwaukee follow.—*Exchange.*

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

"A Subscriber" asks for "a good method of laying out hips and jack-rafters" giving lengths, side cuts, and other bevels also how to get the bevels of a valley rafter when a roof has two pitches; the whole to be done by the use of the "Steel Square"?

ANS.—In answer to the above questions, we do not know that we can do better than re-publish the following, on "Roof Framing by the Steel Square," which is taken from Hodgson's second volume of "Practical Uses of the Steel Square," published by Frederick J. Drake & Company, Chicago. Fig. 1 illustrates a hip roof with a full series of diagrams showing [illegible] lengths and bevels are obtained for a roof covering a plan of 60 x 24 feet, one-third pitch, rafters and jacks 16 inches apart.

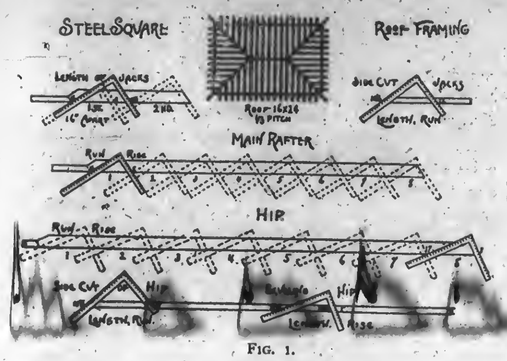


FIG. 1.

MAIN RAFTER.

One third pitch rises 8 inches to the foot, and as 8 feet is half the width of the building, the run must be 8 feet. Therefore put the square on 12 and 8 and eight times gives the length and bevels (as illustrated). Notice how it is sqared up at heel, and amount allowed for ridge.

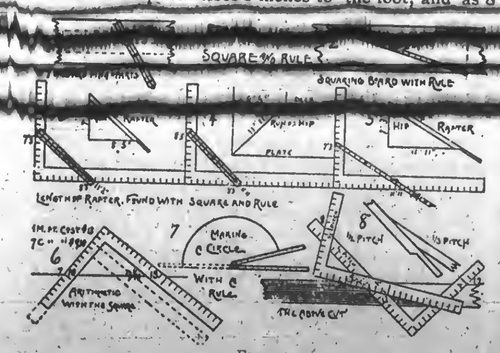

SQUARE 8 & RULE 12
SQUARING BOARD WITH RULE
LENGTH HIP RAFTER. FOUND WITH SQUARE AND RULE
MAKING A CIRCLE
WITH A RULE
ARITHMETIC WITH THE SQUARE
THE ROOF'S CUT

FIG. 2.

The figures given herewith are given only as examples. Any figures or dimensions of plan will give correct results if treated in the same manner. This also applies to any pitch.

As the diagonal of a foot is 17 inches, take 17 inches on blade in place of 12, and we have hip rafters (as illustrated).

Now these methods are not new or original, as they have probably been used for ages, yet it is surprising how new carpenters know them.

Lay the square on the same as for common rafter. If you wish them 16 inches apart, move the square up to 16 inches; if 18 inches apart, move up to 18 etc. The side cut is the length and run. Cut on length. If you wish to bevel toe of hip, take length and rise. Cut on rise.

OBSERVE ALL THE ILLUSTRATIONS.

Now remember the same method applies to all pitches. Run the same; simply change the rise to whatever rise the roof is to the foot. This applies to cornice as well as rafters.

PRACTICAL USE OF SQUARE AND RULE.

Study and fully understand the eight illustrations in this one little cut, and you will find, by thought and application, as the occasion requires, you have learned a great deal, and you will readily learn more.

If you have a board 7 inches wide and wish to divide it into four equal parts, turn the rule until it strikes eight inches, and mark at each 2 inches, as in No. 1 Fig. 2.

IN LAYING OFF RAFTERS.

Some may not like to place the square on once for

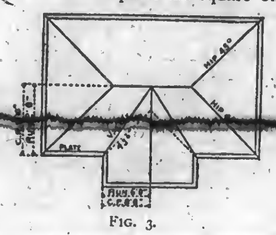


FIG. 3.

every foot of run, as illustrated. Also, if it is to go to [illegible] exact size to the foot, figuring out the fractions, etc. Take a roof to be 7 feet 3 inches high and run 8 feet 5 inches. [illegible] you will have 112/12 or 11 feet 2 inches length of rafter, as seen at No. 3 Fig. 2.

If you wish to hip the same roof, as it is 8 feet 5 inches to the deck, the run of hip must be the diagonal of 8 feet 5 inches, which is 11 feet 11 inches. The run being 11.11, and the rise 7.3, place the rule on them, and we have 14 feet, as shown in No. 3 Fig. 2.

When a roof is of two pitches, say half pitch and one-third pitch, and it is wanted to cut the one-third rafter to lay on the half pitch roof, lay off the half pitch line, and from that line lay off the one-third pitch line, and you have the proper bevel. So with all the double pitches.

UNEVEN PITCHES.

Irregular, uneven or unequal pitches are simply different pitches in the same roof. When they are the same on all sides and the building is square, the hips or valleys run in from the corners at an angle of 45 degrees, regardless of the rise of the roof, but should one side be steeper than the adjoining side, or the gables be of different pitch from the main roof, then

the hips or valleys depart from the 45 degrees angle.

Fig. 3 shows a roof plan with the one-third pitch on the main part, with a half pitch gable. The seat and down cuts of the jack and common rafters remain the same as in the even pitch roof, except the top cut of the jack.

We will not take up space to explain this cut at length, but will give that obtained by the square as follows: Take to scale the length of the left common rafter on the blade and the run of the right common rafter on the tongue. Blade gives the cut of the left jack, vice versa for the right jack. Figs. 4 and 5 illustrate these cuts.

Here is another problem that comes in connection

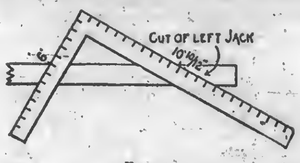


Fig. 4.

with the uneven pitched roof. Where a projecting cornice is desired, with planceer, the valley will not rest at the angle of the plate, but at a point in line with the intersection of the cornice, as shown.

This necessitates the plate on the steeper pitch being raised as much as the difference in the rise of the pitches in the width of the cornice.

Thus if the cornice be 18 inches wide, the rise of the half pitch is 18 inches, and that of the one-third pitch is 12 inches, a difference of 6 inches. Therefore, the proper height of the plate above that of the low pitch is 6 inches.

In connection with the above are given the following explanations and diagrams for finding the lengths of rafter where the rises in the roof are of different heights. For example, we will suppose the main gable, Fig. 6 to be 24 feet wide with a 14 foot 8 inch rise. In a case of this kind it is better to let one of the valleys extend on up to the ridge board of the main gable and let the other valley rest against it (the long valley). But how to locate them on the square is the main question, and place the square as shown on

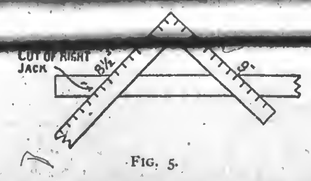


Fig. 5.

square No. 1 lay off the run and rise of the wide gable, and same for the narrow gable on square No. 2.

2nd. By connecting the run and rise, as shown by the diagonal line, on each of the squares will be the length of the common rafter.

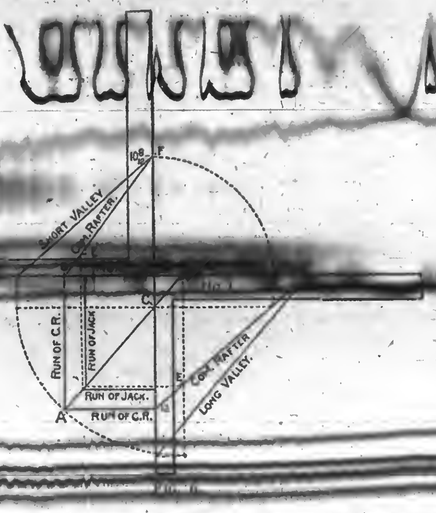
3rd. Square out from the tongues as shown, till they intersect at A, which will be the runs of the gables or of the common rafters.

4th. Set compass at B., and open to equal the rise of the narrow gable and swing to the blade of No. 1 and square in to the common rafter, thence run an imaginary line parallel to the blade, and where it intersects the tongue establishes the point where the ridge of the narrow gable dies or intersects on main roof and which point I will call C.

5th. A line drawn from A to C represents the run of the short valley, and by extending the line on to the blade of No. 1 establishes point D, from which to B represents the run of the long valley, and these lengths taken on the tongues as shown, and connected with their respective rises, will be their lengths.

The lengths of the jacks are found as shown from E to F, which we trust is clear enough without further explanation.

The cuts and bevels are all contained in this diagram.



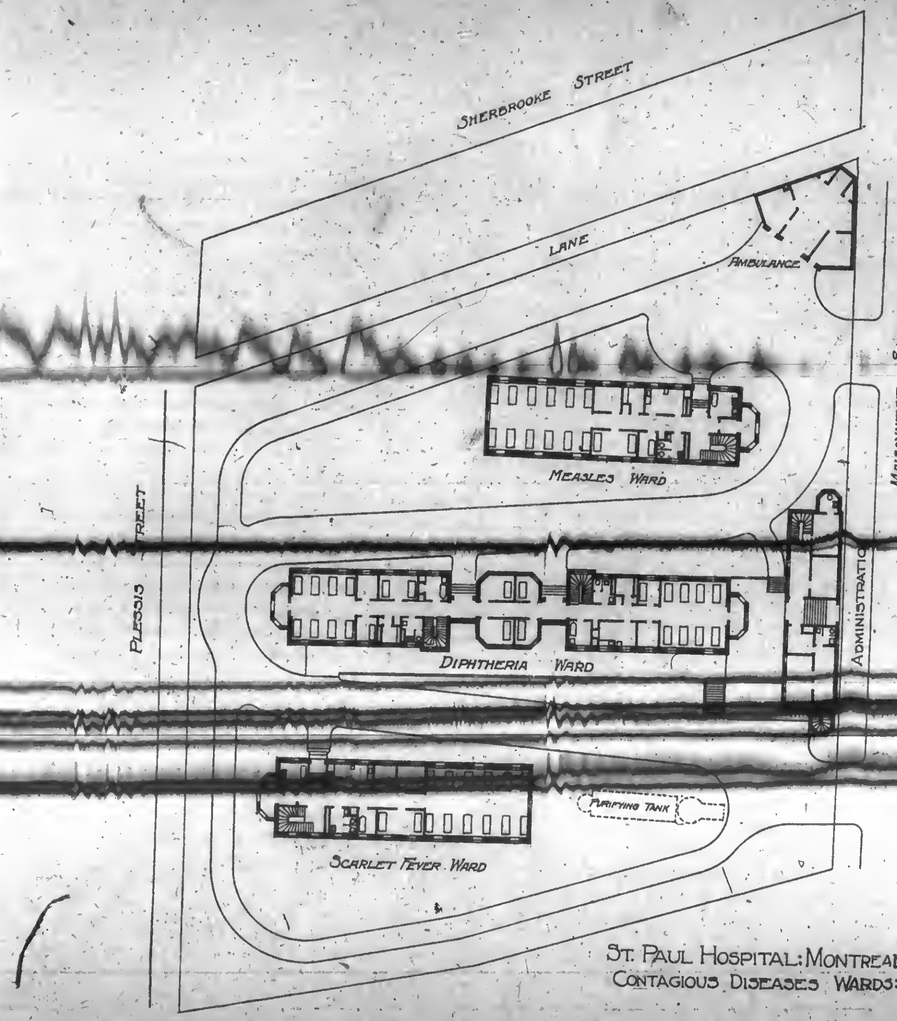
From "Bricklayer." About what is the cost per yard of a good Portland concrete and cement floor for a cellar; also, what is the cost (about) of a cubic yard of cement concrete? What proportions of cement, sand, etc., are required to make good work?

Ans.—Good work for a cellar floor in concrete with a smooth finished surface is worth about $1.25 per yard super. when laid not less than four inches thick. This would be at the rate of about 14 cents per foot super and about 42 cents per cubic foot. There are twenty-seven cubic feet in a cubic yard so at this rate a cubic yard of concrete, would be worth $11.34—a sum very much too large. A cubic yard of concrete, laid in a solid wall should not cost more than $4.50 and contracts have been taken in this city for less than that. Concrete should be composed of pure, clean water, broken stones, a ballast or clean-pot gravel, with such proportion of sharp sand as will fill the voids between the stone or gravel, and this latter should not be larger than such as will pass through a ring one and three-quarter inches in diameter. The proportion should never be less for Portland cement than one to six parts of stone and sand combined, and the concrete should be put in place steadily and as evenly as possible and tamped down in layers not more than twelve inches thick.

In answer to your second query, we may say that a cubic yard of mortar will lay about four and a quarter cubic yards of brickwork, or seventeen square yards of 9 inch wall, say about 1,600 bricks.

MONTREAL NOTES.

The contagious diseases pavilions of the Hospital of Notre Dame, known under the name of St. Paul's Hospital, have now been formally opened. The consecration of the buildings by Archbishop Bruchesi took place on the 29th of October and for some days thereafter the buildings were thrown open to public inspection. They are situated close to Sherbooke Street on the east side of Lafontaine Park. This is one of two hospital—the one Protestant the other Catholic—towards which the city has undertaken to contribute during twenty five years an annual subsidy of fifteen thousand dollars each. The main building or new Hospital of Notre Dame proper is intended for general cases. This part of the work is still in course of erection whilst the contagious diseases portion of St. Paul's Hospital, standing on the opposite side of Maisonneuve Street, is now in operation. A tunnel under the street connects the two buildings. The main kitchen is in the basement of the general hospital. The buildings which are finished have a neat and cheerful appearance, with low pitched slated roofs overhanging broadly at the eaves in a picturesque way. The walls are faced with brick made of sand and lime which is having considerable vogue in Montreal just now. The brick is of a pleasant grey color, and is soft and pliable, though it is said to harden with time. In this case the surface has been diversified in places by the introduction of bricks of a darker tint in a not too worrying lattice pattern.



ST. PAUL HOSPITAL: MONTREAL
CONTAGIOUS DISEASES WARDS.

The St. Paul's Hospital accommodates one hundred patients and has cost $225,000. Diptheria, scarlet fever and measles alone are treated. The buildings have been finished with severe simplicity, and it has not been found possible with the means available to adopt a fireproof construction, a fact much to be regretted in an institution of the kind. In the Administrative building as well as in the various pavilions simplicity is the ideal striven for. The doors are flush panelled. There are no architraves and no mold-

ings anywhere. The floors generally are of birch. The walls even in the little operating rooms are entirely of hard plaster, with all angles rounded and the junctions with the floors effected by cavettos without fillet. A number of the private wards in the diptheria pavilion are separated from one another and from the corridor by glazed partitions for facility in supervision. The ward nurses' rooms adjoining the wards are in a similar manner arranged with glazed partitions between them and the wards. Warmed and purified air is impelled into all the rooms through ventilating shafts from a central system. These shafts generally find their place in the ceilings of the corridors and deliver the air into the rooms at a high level. In the small rooms the outlets are at a low level—in the larger they are both high and low and the extraction is by means of fans connected with ventilators in the roofs. The whole of the sewage is disinfected in a large underground tank before being run into the public sewage system. Messrs. Marchand and Haskell are the architects.

The Protestant Hospital for contagious diseases, above referred to, is also being hastened to completion, with a view to being opened at the beginning of next year. The Alexandra Hospital, as it is called, is situated at Point St. Charles, and considerable difficulty and delay were encountered at the start owing to the natural drawbacks of the site. The cost is stated at $250,000 and great efforts are being made in order that the new buildings may be opened free of debt.

A great majority of the permits for building issued in and around Montreal are classed under the heading of "tenements." In most cases these are merely erections of about twenty-five feet frontage on a site one hundred feet deep, more or less, and having a separate dwelling on each of two or three stories. It is the fashion to obtain access to the first of the upper floors, if not also to the second, by means of external stairs not necessarily of any great beauty of design. The desirability of this arrangement is obvious for it is naturally preferable to encumber your neighbours drawing-room windows with your front stair rather than to have that stair taking up space inside your own house and incidentally, in his [illegible] provide for the building line being set back so many feet from the street, but they do not say anything about this picturesque feature. Recently some of the proprietors in the town of St. Louis have been petitioning their Council to take steps to oblige proprietors in future to construct such houses with stairs inside instead of outside.

In the Westmount Council also the question of "flatted" houses has been the occasion of some hard thinking lately. Here the apartment house as such has been meeting severe condemnation and by-laws are proposed to prevent their being built at all as being "unsightly and generally unsanitary." A resolution of the Council, on the 6th November, declared that flats or apartments where the number of cubic feet of air was insufficient are a public nuisance and dangerous to health, and that the town engineer should be directed not to grant to persons wishing to erect such buildings the proper sewer connections. Where the aggregate floor space of a building was greater than the superficial area of the lot on which it was erected the building should be considered a public nuisance. A notice of motion was given for changing the by-law on the subject.

The demand for department houses in the city of Montreal, however, is a very real one and cannot be repressed altogether in the manner such a resolution would suggest. The floor space allowed, according to the resolution, seems absurdly low, but there can be no doubt that the subject of the proper regulation of the apartment house is one of vital interest to the city at the present moment. An evidence of this from an entirely different point of view may be found in a lecture which was delivered to the Nomad Club on the 8th of November by Mr. Roswell Fisher. The title of the address was 'Homes of the Future,' and the lecturer took the view that, in the inevitable course of evolution, the apartment house was destined to be the home of the future, and, for this reason, was destined also to much higher development than it has at present reached. The nature of this development, in Mr. Fisher's opinion, was to take the form of large apartment houses provided wtth common gymnasia, ball rooms, club rooms, hospital service, etc. Now it is true that, even amongst the audience before which these views were expressed, a good deal of disapproval was met, but nevertheless the occasion shows another side to this question which thoughtful, practical men may be found willing to entertain and discuss.

This is a subject one would like to hear discussed by such a body of practical men as the Province of Quebec Association of Architects, but on this as on all other matters of public interest in the architectural domain, that body displays singular quiesence. Whilst all around are discussing these things it alone is dumb. One unfortunate consequence of this taciturnity is that, as has been pointed out in these notes on other occasions, it meets with its natural reward by being in turn completely ignored by a public whose interests it does not take the trouble to discuss. The competition for the mountain outlook was a case in point—another may be found in the amended building by-laws lately issued by the city. These amendments have been drawn up with reference to the P. Q. A. A., no suggestions or opinions regarding them being asked or given. What public interests then does this association serve?

CONCORDIA SALUS.

SKETCH CLUB P. Q. A. A., MONTREAL.

On the 18th of October the first Sketch Club Designing evening of the session was held. Mr. W.S. Maxwell was in charge and set the subject which was a "Memorial to an Architect". The conditions were as follows: "In a side-chapel measuring sixteen feet square, in an English Renaissance Church of a provincial town, it is desired to place a memorial to a distinguished architect. This memorial is to provide in some suitable manner an evident receptacle for the ashes of the Architect, whose body is supposed to have been cremated. The memorial is to be isolated from the wall." Two hours was the time allowed for the preparation of the sketches which the members handed to the Secretary before leaving the room.

At the club meeting on the evening of the 1st November the sketches were exhibited and the committee's award announced, Mr. McLaren's design being placed first. In the absence of Mr. Maxwell, who was ill Mr. Archibald criticised the designs. After the criticism a number of lantern slides of recent and contemporary work was exhibited and remarked on by the meeting generally. The slides illustrated, amongst other buildings, Parliament Houses, London, England; the Law Courts; the British Museum; St. George's Hall and Walker Art Gallery, Liverpool; and a number of the works of John Belcher, R. Norman Shaw, T. Colcutt and others.

On the 25th October Mr. Alexander Wright spoke on the Renaissance Architecture of Italy, taking W. J. Anderson's History of the Subject as the basis of his remarks. The speaker summarized the contents of the book, illustrating each point from an independent standpoint and bringing into relief the author's special excellence in the criticism of architectural design. This was further impressed by the exhibition of a large number of slides of the most important buildings of the period treated of; Mr. Anderson's views being referred to in each case. At the close of the address some general discussion took place and a vote of thanks was accorded to the lecturer.

PROF. NOBBS ON DECORATIVE HERALDRY.

The club met, on the evening of the 8th of November, to listen to a discourse on Decorative Heraldry by Prof. Nobbs of McGill University. The Professor first gave a broad view of the subject, pointing out that heraldry holds a high place in Architectural decoration by reason of its lending significance, and thus giving life to ornament. Proportion rather than ornament is no doubt the first and great essential of all architectural design, in spite of what Mr. Ruskin has almost persuaded us to believe, but nevertheless ornament without significance is worse than useless. The two great sentiments expressed by decorative arts are, first, religious veneration, and second, the mark of ownership by a person or a community. The latter is the sphere of decorative Heraldry.

The lecturer proceeded to point out how natural heraldry, as exemplified in the totem worship of savage tribes and in the composite symbolic figures of early civilizations, formed the basis of that scientific heraldry which reached its growth in the fourteenth century. The reason for this was the growth of a social system, with the family as a starting point, and of the ordered gradation of authority known as the feudal system.

[illegible] always closely associated with dress. The familiar term 'coat of arms' applied to the group of shield, helmet and helmet crest implies this. The bend or diagonal band adorning many shields may have been derived and in particular cases certainly did originate in the fact of a man wearing a brilliantly coloured sword belt at the time of his performing the act for which he received the right to bear arms, and the fess or horizontal stripe across the middle of a shield may be taken similarly to represent a sash. What more frequently happened in later times, however, was that the bearings of the shield were transferred to the dress of the holder. Thus, in the fourteenth century, the idea of heraldry permeated all ornament and was developed with keen appreciation and artistic skill. A long period of deterioration in the quality of heraldric designing set in at the time when the shield and helmet began to be disused as defensive armour, and, though the science persisted, the artistic life went out of it. The revival of good heraldry at the present day was not at all due to persons proud of their right to bear arms but simply to the better decorative designers of the Victorian era, who saw the ornamental possibilities and the high artistic value of heraldry properly regulated.

As regards the present day ideas of how a coat of arms should be designed for architectural or any other decorative purpose, several mistaken notions are very widely spread which might be avoided by keeping in view the fact that there is a certain number of rules of good usage which should not be transgressed, yet within these there is considerable room for elasticity in the matter of design. The first of these common mistakes is to suppose that the coat of arms once drawn, the exact form and proportion of every part is inflexibly fixed. The shield for instance is never limited to any particular shape, with the single reservation that a gentleman's arms are usually portrayed on something with a real or fanciful resemblance to a shield whilst the arms which a lady bears in her own right are represented on a lozenge or diamond shaped background. A second common error is to suppose that the cross hatched or dotted backgrounds, which were really introduced by engravers as a means of indicating the color which they could not render otherwise, are some essential part of a coat of arms. They are on the contrary an ugly invention, and should be avoided in all good heraldary. A third mistake is to suppose that a crest is something that can be used apart. It is not a crest at all unless it is upon the helmet, and the helmet ought to appear only over the shield bearing the arms themselves. Fourthly it is common to suppose that the right to bear arms is inherent in per[illegible] people do not know that they have the right to bear certain arms they should make enquiries of the heraldic authorities and not appropriate what belongs to others.

Coming to the question of designing coats of arms, Prof. Noble emphasized the point that the written description, or blazon as it is called, is the first essential thing to have. Examples of the same coat of arms vary according to the decorative requirements of the case, but in no case must the design contradict or fail to comply with the blazon.

Heraldic [illegible] the shield, charges, augmentations of honour, marks of cadence, and marshalling was explained and illustrated by numerous diagrams in colour specially prepared for the occasion. Amongst other things the composition of the union jack was analysed. Helmets and their historical and decorative varieties were discussed, and, finally, a number of lantern slides were exhibited showing the application of heraldy in stone, wood, iron, stained glass, etc., and with this the lecturer brought his remarks to a close.

The lot purchased by the Toronto Builders Exchange, on the N. W. corner of Bay and Adelaide streets, Toronto, with the intention of erecting an office building on it, is to be sold again. An essential part of the scheme was to have been a bank which would undertake part of the cost of the building. But a canvass for stockholders was not sufficiently successful to warrant proceeding with the scheme and it has been abandoned. But some individual members of the Exchange, believing the lot in itself to be a good investment, have formed a syndicate to hold the lot for sale. The house now standing upon the lot is a survival of the earliest days of Toronto, when ploughshares were commoner than planes, and the most modern improvement was the substitution of horses for oxen.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
535 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.
22 GREAT ST. HELENS, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms:- Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	-	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	-	S. G. CURRY, "
2ND VICE-PRESIDENT	-	W. A. LANGTON, "
TREASURER	-	HENRY SIMPSON, "
REGISTRAR	-	W. R. GREGG, 96 King St., Toronto

COUNCIL:

J. W. SIDDALL	Toronto
JOHN G. [illegible]	"
[illegible]	"
JOHN L. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	J. S. ARCHIBALD, Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSE, Montreal
2ND VICE-PRESIDENT	R. P. LEMAY, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. E. BROWN.

COUNCIL:

JOS. VENNE	Montreal.
H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
[illegible]	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOIDGE, President.
GEORGE DOTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, JR.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNEY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 478 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADLEY.
C. P. SHINDLER
K. M. FRASER
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: T. G. Latimer, H. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bonche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Colter, T. A. Giroir.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. [illegible]ERTS, Vice-President.
PHILLIP LARKE, Hon. Treasurer.
J. HERBERT LAVER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY,
GEO. H. HOOD,
Past Presidents

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUS E. Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B. C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN - - - Chairman
R. W. WHITTINGTON - - - Secretary
THOS. CATTERALL - - - Treasurer

PERSONAL.

Mr. J. C. Dumaresq, a leading architect of Halifax, Nova Scotia, was a recent visitor to Toronto and Montreal. He reports having had a busy season.

Mr. Edward Copping, who was engaged in the municipal inspection of buildings for Toronto for thirty one years, and has been a familiar figure to a generation of Toronto architects, has resigned. Mr. Copping has passed his seventieth year, and has not been actively engaged in the inspection of buildings for some time past.

It matters not so much what a man cannot do as what he can do. That is what gives him mastery.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

THE TRADERS BANK OF CANADA BUILDING, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1905

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XVIII.—No. 216. DECEMBER, 1905.

ILLUSTRATIONS ON SHEETS.

The Church of St. Mary, Toronto.—The late Joseph Connolly, R.C.A., Architect.
Apartment Houses belonging to the Washington Sanitary Improvement Company, Washington, D. C.—Choir Seats by C. A. Voysey.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Hall and Living Room in Residence of Vaux Chadwick.—Messrs. Chadwick & Beckett, Architects, Toronto.

CONTENTS

Editorial	177	Montreal Builders' Exchange	190-191
The late Mr. J. W. Hopkins	178	Painting New Woodwork	iv
Exhibition of the Society of Applied Arts	179	Exhibition of British Manufacturers in Egypt	viii
British Fire Prevention Committee Test No. 99	180	Glass Buildings	viii
Building for the Toronto Builders' Exchange	180	Convention of Canadian Clayworkers	ix
Our Illustrations	181-182	Toronto Builders' Exchange	ix
Correspondence	183	Cost of City Halls	x
R.I.B.A. President's Address	184-185	Seventh International Congress of Architects	x
A Tribute to Sir Rowand Anderson	185	No Plasterers Combine in Ayrton	xii
Intercommunication	186-187	Mr. Walter Crane on House Decoration	xiii
Reinforced Concrete Construction	187	Winter Roof Gardens	xiii
Montreal Notes	188	Hustle and Bustle	xiv
The Sketch Club, P.Q.A.A.	189	Tests for Building Stone	xv
	190	The Growing Use of Concrete	xvi
			xvii

A Denial.

In our last number, in a note entitled "Combines and the Law," it was stated that the plasterers have burned down [illegible] of the Toronto Builders' Exchange, writes to say that this rumour was unfounded, and begs that we will give the same prominence to his denial of it that was given to our acceptance of the rumour. This we are glad to do.

The Year's Work.

The building records for the year show that the phrase "Canada is growing" has its origin in fact. The approximate value of building in Montreal, Toronto, and Winnipeg amounts to $20,000,000. The sum is nearly equally divided among the three cities—which makes the record of Winnipeg with its smaller population remarkable. We have the most exact figures for Toronto, but there is no completeness in the estimate until the close of the year; there were 238 building permits added to the list in November alone. The total number of permits during 1905 up to December 1st, was 2933. The evidence that this is a "growing time", exceeding the normal expectation of increase, lies in the comparison with last year, on the same date, when there had been only 1620 permits issued, representing a value of $5,640,000. The process of growth is plainly evident in Toronto among the factories, and one cannot walk anywhere in the residential districts without seeing new houses in course of erection. In some parts the appearance of things has been like the making of an exhibition; roads, sewers, buildings, all going on at the same time. And a walk through the same district at intervals of a month shows startling changes. If this is so of Toronto, there must have been, this summer, a wonderful exhibition of energy in Winnipeg, where the excrescence has been greater in proportion to the body and the building season is not so long.

Telephone Poles off the Street.

The way in which our streets are spoiled by telephone poles is pretty generally recognized. It is only despair that keeps us from saying much about it. The constitutional privilege of grumbling finds its exercise chiefly among people of leisure. People like ourselves, who have to work, dislike disturbing themselves by agitation unless there is to be some result. It has been proved in [illegible] that there is nothing impossible about the proposition to put telephone wires underground, and that is where they will [illegible] the principal provisions which will produce that result, in a limited way, before long. But, in the meantime, it is not necessary that we should suffer to the extent we do from the erection of crooked poles and the stringing of glistening wires. The establishment of a good residential street means that a number of people will live there who will use telephones. So up go the poles on both sides of the street, carrying a bunch of thirty or forty wires apiece, with guy-wires and service-wires running out from them at all angles. Exit the perpendicular line from the composition of the street; for it is an extraordinary thing how the eye is thrown out by a slanting pole, so that building lines adjoining it seem to be also out of plumb. Now all this is unnecessary. Without in the least attempting the task of preventing the erection of poles at all, it is a simple matter to have them removed from the streets; to prevent their erection in front of buildings by requiring their erection at the back. In most parts of this country we suffer from the rectangular arrangement of our streets. It is a pity that we should also suffer from an evil which this dull arrange-

ment is peculiarly adapted to remove. As one looks up a long straight street, afforested with poles, and reflects that there is nearly always a long straight lane behind, or, if there is not a lane there is a vacancy in which, where the back-lots meet in a fence, the poles may be run without being in anyone's way, and where nobody is likely to object to their being run, it really seems as if an agitation to have all poles placed at the back instead of in the streets is worth attending to, because there could be some result.*

The Plumbers' Combine.

It is desirable to record exactly the method of proceedure of this conspiracy, and it cannot be done better than in the following extract from a leading article in the Toronto *News*. "The process, as it has been explained in the Police Court, was very simple, and may be put briefly as follows: When tenders were called for, those who wanted to bid met and went over the specifications, figured out the work and wrote the amount of their tenders. All the prices were then averaged, and the one who was nearest to the average of the whole was given the contract at a figure agreed upon among themselves, the others being compelled to tender higher, on pain of being expelled from the association. To the cost of the work there was added five per cent. for distribution among the members of the association, and from fifteen to twenty five per cent. extra profit for bonuses to those who had tendered." An example given in Court, that of a small job, merely a residence, shows that "fourteen men got $15 each on the plumbing contract, and the same number got $10 each on the heating contract. This is a total of $350 which was divided among the tenderers for which [illegible] value was given. [illegible] this seem to represent all the overcharge. The association had to get five per cent., and the man who did the work received somewhere in the neighborhood of twenty per cent. more than a fair profit." And the experience of this house owner "was, that of every man who has build a house in Toronto within the past three years." In the case of a dwelling house the ruthlessness of the mode of [illegible] profits, more than where greater sums are involved, but the figures in large work are striking. In the case of the E. & S. Currie building [illegible] plumbing and steamfitting, the subsequent execution of the work by a Philadelphia firm for $4,200, which included railway expenses and hotel bills for their workmen, convicts the combine of an overcharge of about thirty per cent. There was an American architect employed in this case, and the combine did not get their money; but, in the case of the building for the School of Practical Science, Toronto, where an addition of $2,000 was made to the tender, for distribution among the plumbers, they got their money and have got it now. It is this cool proceeding of sitting round a table and dividing money exacted from a building owner, over and above the cost of his work and an exorbitant profit, that has appealed so much to the imagination of the public; but the sum extracted from the pockets of the public, merely by the exaction of an excessive profit was really the more serious consideration from a financial point of view. It meant something over half a million. The *News* makes it, on a fair estimate of the amount of work done, about $664,000. The five per cent. levy on the same work would amount to $166,000; in all $830,000 in a year "filched from the pockets of the citizens."

The secret of the power to work these exactions was the unity of the three branches of trade concerned in plumbing and heating—the master plumbers; the supply men, and the workmen. To quote the *News* again: "The three parties concerned in performing a contract for plumbing were organized to rob the fourth party—the customer. . The supply houses deliberately bound themselves by formal agreement 'not to sell to the general public plumbing goods, hot water or gas fittings. The plumbers' union at the other end, co-operated with the master plumbers by refusing to allow their members to work for an employer who was denounced by the association." The members of the association bound themselves together by an oath to hold to the regulations of the association and to keep them secret. They may not have known that the oath was illegal or that their operations were illegal, but they seem to have been fully aware that their hand was against every man and that every man's hand ought to be against them. That they stepped unthinkingly over the border that separates the legal from the illegal does not say much for the condition of our business world, nor for the state of mind engendered by the exaltation of push and hustle as the truest attributes of manliness. We should not let the extent of their takings blind us to the realization of the truth that the whole proceeding was a wretched piece of boy's work at the bottom: something to make one feel ashamed.

*As we go to press the newspapers give a list of 24 new streets or lengths of street, in Toronto, that are to have poles erected and wires strung on them. This would make a good opening to test the feasibility of putting the poles behind.

THE LATE MR. J. W. HOPKINS.

Mr. John W. Hopkins, who died at his residence in Westmount, on Dec. 11, in his eighty-first year, was conspicuous among the older generation of Montreal architects, and was the first President of the Province of Quebec Association of Architects. He came to Montreal, in 1852, at the age of 27. He was the son of John William Hopkins, an officer in the commissariat; and the grandson of John Hopkins, a naval officer of some celebrity, who was in command of the revenue cutters on the west coast of England and was presented with a silver mounted cutlass, by the customs commissioners under King George III., in recognition of his services.

Mr. Hopkins was the architect of the Montreal Custom House, the Harbour Commissioners' office, and many of the large mercantile buildings in the city. He also built a number of residences, and was the designer of the St. James Club house, and one of the early members of the Club.

Besides his membership of the Province of Quebec Association of Architects, Mr. Hopkins was a Royal Canadian Academician, a life member of the Mechanics' Institute, a charter member of the Montreal Gymnasium, a life member of the Art Gallery, a governor of Verdun Hospital, a member of St. Paul's Masonic Lodge, a captain in the 5th Battalion Light Infantry (now the 5th Royal Scots) and a justice of the peace.

His wife survives him. He leaves six children—five sons and one daughter.

EXHIBITION OF THE SOCIETY OF APPLIED ARTS.

The second Exhibition of this Society held in Toronto from Dec. 9th. to the 23rd., is in many respects interesting and in some respects excellent, but it is not on the whole—what it ought to be—inspiring.

What is applied art? It appears, from the pamphlet sent out by the Society in giving notice of this Exhibition, that the application they have being aiming at is not very wide. They give a list of the classes of work to be represented in the Exhibition. These are:—Decorative designs; Mural decoration; Stencilling; Illumination; Stained glass, including glass blowing and glass mosaic; Work in metal, including jewelry; Enamelling on metal; Photography; Pottery, including decorated china; Wood carving; Furniture; Leather; work; Book binding; Needlework; Textiles; Basket work; Inlaid work; Bead work.

Here we recognize a general sketch of the field of what is known as Art. With a few exceptions, the objects that are associated in our minds with these classes of art are objects that are made and set before us chiefly to be looked at as objects of beauty; and the exceptions—furniture, textiles, book binding, basket work—are not exceptions in this [illegible] furniture is of the ornamental kind [illegible] with (though of a most useful and durable kind), has been made with a dilletante handlelessness that seems to place it outside of the working class; the textiles even—good Canadian homespun—are all woven and worked in the form of portières, lambrequins, etc., about which some restive architects may raise the question whether they are applied art or misapplied art, but which at anyrate are mainly intended to be looked at; and the book binding is of that soft [illegible] back, and not backbone enough to get up off the drawingroom table.

Here is a programme of work that it is difficult to separate in function from Art—all alone without any qualifying prefix. It looks as if Applied Art is, to the Society, everything that is not Graphic Art, but serves principally the same purpose—to please the eye. Whereas the present writer [illegible] ing to see objects which, having some other principal purpose, are, by the application of the principles of art, [illegible] made pleasing to the eye. This was what William Morris aimed at doing and did do; and the Society of Applied Art claims William Morris for its father.

It is not going far, indeed not going at all, in the direction William Morris led, to get together a little separatist band who will produce decorative articles made by hand, to enable people to get back, in the decoration of their houses, to another and a better age. There is no better age for us than our own age. That is what we are born to, and our art, if it is to be art at all, must be of our own age. If these ladies and gentlemen want to apply art in the twentieth century as it was applied in the thirteenth, fourteenth fifteenth or any other century, when it was applied properly, it is of no avail for them to do what the craftsmen did in those centuries; they must do *as* they did, which is quite a different matter. The glory of those days was not the simplicity of their work, as the modern "craftsman" seems to think, but the simplicity of their purpose. They made things that were ugly enough and coarse enough often, but the vulgarity of being one thing and trying to look like another is, as an aim in art, post-renaissance; and the result of the elevation of the machinist to the post of art producer is that this is his only aim; he cannot design for himself. His work is imitative; it is made to look like something else. In one word his work is not simple.

It is this want of simplicity in purpose in our art, not the means of its production that a society like the society of applied art should work against. To go back to hand production is not the way to do anything. This is an age of machinery, and if they mean to reform our household art they must use the ordinary methods of our day. That is what the craftsman did in the earlier centuries; and we may be quite sure that they despised nothing, in the way of mechanical assistance, to help them along in the mechanical parts of their work. As a matter of fact the most determined modern "craftsman" does not insist upon sawing up his own timber, or sizing it, or even rough-planing it. He does use machinery to prepare his rough material; why not let machinery prepare it a little further? There is nothing particularly noble in digging out a mortise by hand, or in wittling tenons. A machine can do this just as well; then let a machine do it. Then as to shaping his wood: why drive a saw through wood, for a distance that amounts up to miles in a day, when a band saw will run more miles and more smoothly? The mere action of the saw is mechanical and a machine had better do it. It is necessary to direct the course of the saw by directing the line of application of the wood against it. But this only requires a strong hand; and stronger hands than his are ready (and anxious) to work at it. They can do all the mechanical operations as well as he, or better. Where then does the craftsman-designer come in? He does not come in at all; he goes out. The craftsman-designer is extinguished and in his place is the designer pure and simple.

There is plenty of work for the designer to do; and, if he *is* pure and *is* simple, there is no reason why he should not do as good work as ever was done by designers who [illegible] their own hands at the [illegible] of their designs. But he must [illegible] the machine, which is indeed quite respectable. Neither in design nor in construction should the defects of [illegible] be laid to its charge. They are all the work of the designer and of a public whose vulgarity is reflected in the untruth of the articles supplied to them for daily use. Things for use appear to be things for ornament; things for ornament appear to be things for use; hollow things appear to be solid; poor things try to appear rich, (one cannot say they ever appear so); new things imitate the appearance of age; every thing is so shaped in insincerity that the true designer finds little in a house to which his heart really warms except the kitchen table.

It is this feeling that has animated the Arts & Crafts people; only they have made the mistake of assuming, (in practice at any rate), that, because they find rude art true, therefore true art must be rude. And they have separated themselves from the world to wear homespuns and flannel shirts, to hew out their furniture by hand, to leave out nearly everything in a picture and call it decoration, to make built up pottery and set it up for worship; (they ought to eat their food out of it, but they draw the line at that); to live in an atmosphere of what is called art, partly from re-

pugnance to the world and partly from love of it. They would willingly convert the world to a better way of thinking and hope by exalting a true standard of taste and originality in design, (but it is not original), to bring about this consummation.

They have brought something about. We owe to them the wave of sham simplicity that is sweeping over us, and sickening us of things good in themselves because they are thrust upon us as the whole of art and because they too have become shams.

Is not this enough to convince members of the Arts and Crafts bodies, whose artistic conscience is involved in their course, that it is a wrong course? The living present demands from us something more than this hankering after the conditions of a dead past. We have our own problems and our own conditions of production, and the simple life is to be found in tackling these. For artistic simplicity does not consist in crudeness, or rudeness, or in the absence of what is rich. Simplicity is directness, and in directness is the character of true art.

For the application of this principle there are many problems awaiting the Society of Applied Art. There is a simple problem to begin with in the radiator—a small affair, easily mastered. It will not do to evade the difficulty by concealing the monster behind a grille which will retain warmed air round the radiator and prevent it parting with its heat, which it only does in proportion as the air is relatively cool around it. The design of a radiator is a question of the fixture itself that it may stand forth naked but, (like Adam), clad in native worth and honour. People shrink from the radiator because it is cast; but so is an altar-cross, the synodsural ornament of a church. It is the mishandling of cast work that is at the root of its offence, and if the [illegible] would study its proper utilitarian treatment, they would do a real service in Canada; for cast metal is prominent in our contrivances for heating. One would be glad to return to the old cast frame and hanging grate, if we could have the frame made an ornament instead of an eyesore. The modern movable basket under a flue in a cavernous fireplace is not in the same class for giving out heat, which after all is the function of the fireplace. Then there are stoves, a large field of effort and not at all a hard one to hoe. [illegible] confined to metal nor is there any limitation in shape. We may have close stoves and open stoves; stoves of metal; stoves of tiles, porcelain, soapstone and doubtless many other materials, alone or in combination with metal. We may have little stoves in the corner; stoves beneath a mantle shelf; large stoves a storey high, with an open fireplace below and chambers for hot air above. And as for decoration—here is a large field for development; with a plastic material, and in the very situation for adornment, since it is the literal focus of the room and all eyes turn towards it in moments of repose.

It would be interesting to go through the whole house in search of objects which lack the proper application of art; but we must leave it for the present. The subject is certainly one that would open up if it received attention.

We recommend it to the care of the Society of Applied Arts, confident that it will take care of them in in return; for they are much more likely to grow and be great if they breathe more of our modern air and less of the atmosphere of dead centuries.

BRITISH FIRE PREVENTION COMMITTEE TEST NO. 99.

We have received Red Book No. 99 of the British Fire Prevention Committee, giving an account of a fire test with a 2½ inch partition of porous terra cotta hollow tiles erected by the National Fireproofing Company of Pittsburg, Pa.

The tiles were 12 in. by 12 in. by 2½ in. thick with three vertical perforations, 3 in. by ½ in., in each tile. The tiles were soaked in water and built up with a mortar of 1 cement to 2 sand so as to fit exactly against the floor, walls, and ceiling of the brick testing hut (10 ft. wide and 8 ft. 10 in. high), and divide off a portion for the introduction of fire. The partition was plastered, on the fire side, two coats, with mortar containing a handful of hair and a bushel of asbestic to one yard of clean sand and half a yard of grey lime. By means of gas, introduced into the chamber under regulation, heat was applied for two hours and a half, gradually increasing to 1980° Fahrenheit, at which height the temperature was maintained for 50 minutes. Water was then applied, through an observation hole, from a steam fire-engine, for 2 minutes.

The finishing coat of plaster flaked off during the first five minutes of the test; the first coat remained in position until water was applied, when most of it was washed away. The partition bulged 2 in. towards the fire, and several cracks appeared on the side away from the fire. The face of one tile on the fire side split off. The ceiling of the hut, which was made of joists in contact with one another, with lime mortar in the joints and asbestic plaster on the surface, were destroyed to a depth of 1½ to 2 in., leaving the head of the partition free, so that smoke passed over it; but neither fire, smoke, nor water, passed through the [illegible] maintained in position at the conclusion of the test. Part of the cement mortar in the joints had been washed out by the stream of water.

The official verdict on the test is as follows:—"This test indicates that it is possible to provide partitions 2½ in. thick, (2⅛ in. slabs and ⅜ in. plastering), having a length of 10 ft. and a height of 8 ft. 10 in., that will prevent the passage of flame and smoke from a fire burning for two and a half hours on the plastered side of the partition, raising the temperature to 1,980° Fahr., and then prevent the passage of water from a steam fire engine jet."

BUILDING FOR THE TORONTO BUILDERS' EXCHANGE.

At a recent meeting of this Exchange the question of erecting a structure of their own was brought up again; and steps were taken which it is stated will bring the project to an issue in the course of the coming year.

THE ARCHITECTURAL ASSOCIATIONS.

The Province of Quebec Association of Architects will hold its Annual Meeting at Quebec on January 25th. The Ontario Association will meet in Toronto on January 16th. The business of the Annual Meeting will take place on the afternoon of the 16th. The following day will be devoted to reading and discussing papers. At 11 a.m. Prof. P. E. Nobbs, of McGill University, will read a paper on the Official Architecture of European Capitals; at 2.45 p.m. Mr. Owen Brainard, C. E., of New York, will give one on Fire-Proof Construction; at 4.40 Mr. W. A. Langton will speak of City Planning, in connection with the presentation of the report of a special committee appointed to procure a plan of improvements to the City of Toronto and an exhibition and description of the plan. The public are invited to all proceedings on the 17th.

OUR ILLUSTRATIONS.

LIVING ROOM AND HALL IN THE RESIDENCE OF MR. VAUX CHADWICK. MESSRS. CHADWICK & BECKETT, ARCHITECTS.

In plan these two apartments are adjacent; the light on the right of the hall marks the living-room door. The decorative harmony of the hall is much helped by the incidental vase of flowers and its reflection in the mirror, but there is a sort of flowery elegance about the whole work that makes a happy mean between the florid and the severely chaste. Much is due to the carved panels worked by Messrs. McCormick, Toronto, on the drawer and cupboard doors of the old cottage sideboard which, (in consequence of the utility of its cupboards), is applied to the purposes of the hall table; and to the elegance of the mirror frame, designed for its place by Messrs. Roberts & Co., Toronto.

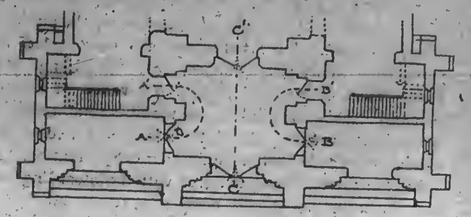
In the living-room there is more adaptation of old articles. The mantel piece came from the old Crawford residence on Simcoe street, Toronto, and is presumably of the date of that house—about 1832. The brass frame within it was part of the mantel in its origional position, except that, as originally designed to carry a hanging grate, the repoussé portions of the frame were in contact with one another and the space thus left on each side between the bl[illegible] f[illegible] woodwork, was filled in by a sheet of brass. The spacing out has now been inserted in the frame. The panel above the mantel was painted by Miss Florence E. Segsworth.

CHOIR STALLS DESIGNED BY C. A. VOYSEY.

There is no denying the vitality of this work and also its beauty, as it appears when studied carefully with a magnifying glass, but that the beauty should be only recognizable on such a close view points to the defect. The work is amorphous. With the exception of the admirable desk-end with the fishes at top, the ends are vaguely shaped and the carving is a mere surface encrustation, with no particular place to begin and no particular place to end. The whole thing is [illegible] of a spirit of protest against the architectualized woodwork which has been a heritage from the [illegible] heritage of doubtful val[illegible] of the principle of harmony with the structure which is at the bottom of it, and in spite of many beautiful old examples of tabernacled choir stalls. But Mr. Voysey's protest goes too far, almost back to savagery. Shaped boards are an abomination. Mr. Voysey's planks have indeen some relative merit in not being much shaped, or shaped in reminiscence of any form which is properly solid. But the thinness, limited width and tendency to shrink of boards, as well as the awkward difference in the character of the end-wood, all point to framing as the proper architectural form of woodwork. Then there is of necessity, a shape, parts, and varying functions—all the elements of true architectural or true craftsmanlike motives for design.

CHURCH OF ST. MARY, TORONTO. THE LATE JOSEPH CONNOLLY, R. C. A. ARCHITECT.

The addition of the spire to this church in the present year completes the exterior except for the insertion of statues under the canopies. In the spire this is necessary for a proper effect of solidity on the angles. The empty canopies are too light. A notable feature of this church, is the vestibule planning which gives gabled projections on each side of the tower to stop the aisle roofs and avoid the weak and unsatisfactory appearance given to the west end* when the tower is flanked by these sloping lines.



By the kindness of Mr. A. W. Holmes, who has lent us Mr. Connolly's plan, we are able to give a sketch of the vestibule arrangement which gives rise to this exterior result. The ordinary entrance and exit for individuals is by way of A-A¹ or B-B¹, cutting off draughts. The nave entrance under the tower, (C-C¹) is for state occasions only, or to let out a congregation *en masse*. This, in some form, is a standard motive in church plans but one cannot recall any case in which it has been made an occasion for external composition in exactly this way.

The arrangement of the smaller entrances is interesting. By carrying up their setting so as to finish with a gabled top which rises above the eaves, the entrances are relieved of the appearance of being mere doorways under a sloping roof, (and are also relieved of snow slides). These entrances are in reality a two-storey composition. The circular windows over them belong to a gallery for the choir which, as is usual in [illegible] (or here the east) end. The stairs which appear in the inner vestibule are the means of access to this gallery.

There is another feature feature about this church worth noticing and imitating, that is the chapel at the [illegible] The Rev. H. J. Heuser says, writing in a recent number of *The Brickbuilder* to give the Roman Catholic point of view [illegible] "The basement chapel should never be made a permanent feature in the church where regular services are to [illegible] means lack the essential circumstances which inspire devotion."

The chapel is entered from the street, as shown in the general view of the church given in our illustrations, but it is also entered from the church by a door connecting it with the ambulatory of the sanctuary. It may thus serve also as a sacristy.

*This church has reversed the traditional relation to the East The entrance is at the East.

HOUSES FOR WAGE EARNERS IN WASHINGTON.

By the kindness of the American Consul in Toronto we are able to give an illustration of houses for wage earners that are being built in the District of Columbia by the Washington Sanitary Improvement Company. Although a private company, its operations are found to be of sufficient importance to justify the insertion of a report on the subject, as an appendix to the Health Officer's division of the Report of the Commissioners of the District of Columbia to the House of Representatives.

The company is a business organization, philanthropic in motive and in the fact that the officers of the

company do not receive compensation for their services, but otherwise aiming at providing a first-class 5 per cent. investment. It has, in the course of seven years of existence, paid a dividend of 5 per cent. per annum on all stock subscribed from the beginning, and has a surplus fund of a fraction over 1 per cent. on the amount of stock issued. Its investments are represented at present by twenty-eight houses, each containing two flats. There is no building done in advance of actual demand. This is a condition of the directors' original prospectus, inviting subscriptions for stock, and is intended to provide for the elimination of speculation.

In plan these tenements agree with the latest English idea that each flat should have a separate entrance, private all the way from the street. With a common stair for several apartments, it has been found that the tenant of the lowest character in a house gives character to the whole house. To avoid this—to give to each flat the proper separation of a home—it is necessary, in small dwellings, to keep down to two storeys, because of the multiplication of street doors and of staircases which accompanies the multiplication of flats.

The English plan, given in illustration of *Notes of Travel* in our number of November, 1903, has the merit of a full front or back look out from every window, for which, however, a 30 ft. frontage is necessary instead of the 20½ feet which each house occupies in the Washington plan. And the Washington plan is more exactly adapted to our needs in other respects; noticeably in the bathroom, in the inside staircases to outside doors, and in the cellar accommodation.

The rents for these houses are $12 or $12.50 per month for a four-roomed flat, and $9.50 or $10 for a three-room flat, with a rebate of one month's rent every year to tenants whose apartments have not required any repairs. In other words, the company allows one month's rent in each year for interior

A Kitchen in one of the Apartment Houses Belonging to the Washington Sanitary Improvement Company.

repairs, and, if no repairs are needed, or to the extent to which it is not necessary to spend the whole allowance, the tenant receives the benefit of it. This feature in the lease is said to have been educative and to have promoted taking care of the property on the principle of a stitch in time saves nine.

Another peculiar feature of this scheme is that though the original intention of the company was to provide homes for residents in the alleys, that form the slums of Washington, and thereby remove the slums, it was considered best to begin this movement by providing improved dwellings for the better class of wage-earners, in the belief that houses vacated by them would be rented by the next grade, and so on until the bottom of the ladder was reached. They assert the belief that in work of this character it is best to begin at the top, having apparently convinced themselves that to act otherwise would result in failure.

Statistics of the tenancy are interesting. Fifty-five families now occupy the flats; 78 adults and 106

A Bedroom in an Apartment House Belonging to the Washington Sanitary Improvement Company.

children. Average number of persons to each flat 3.35. According to occupation: Baker, 1; bookkeeper, 1; carpenters, 2; clerks, 12; conductors street railroad, 3; engineers, 2; labourers, 3; messenger, 1; motarman street railroad, 1; nurse, 1; paper hanger, 1; photographer, 1; plumber, 1; printers, 19; salesmen, 2; stenographers, 2; superintendent of stables, 1; teamster, 1.

It should be added that, although the officers of the company are not paid for their work, the renting of apartments and collection of rents is done by a professional agent of experience who resides in one of the flats and is thus brought into intimate contact with the tenants and their wants. The agent receives for his services a 5 per cent. commission on all rent collections.

STUDENTS' COMPETITION.

Will the author of the design signed "Ha-Ha" submitted in our Students' Competition reported on in our February Number, please send immediately his name and address to this office, or call for his drawings.

The comfort of ease without toil is an illusion, and in all faithful work there is a happiness which is seldom distinctly recognized as such. The consciousness of increasing skill, of gradual improvement, of doing something well, is a joy in itself. Accuracy and good execution are always satisfactory; the very discipline, if not prolonged beyond bounds, is pleasurable.

CORRESPONDENCE

MONTREAL, November 30, 1905.

To the Editor CANADIAN ARCHITECT AND BUILDER.

SIR:—In the October number of the "CANADIAN ARCHITECT AND BUILDER" and under the subject of "Montreal Notes" I find your correspondent refers to the question of the competition recently held by the City Authorities for the new mountain "look-out". He deplores the want of understanding between the City Council and the P.Q.A.A., pointing out the benefits that would accrue to all from a closer connection between the bodies referred to in matters pertaining to architecture.

Permit me to point out to your contributor and readers that the Council of the P.Q.A.A. are fully alive to their duties and responsibilities.

On receiving information that such a competition had been decided upon, a sub-committee called upon the Chairman of the Park Committee of the City Council, and pointed out to him the utter futility of expecting the best efforts of the profession under such conditions as was laid down in the "Look-out" conditions of competition. The whole subject was thrashed out with him, and at his request, we sent a copy of the P.Q.A.A. Code to his committee for their consideration. Nothing further was heard from that quarter. Later, we addressed ourselves to the whole Council on the general subject of competitions asking that, in the future, all competitions be governed by the Code adopted by the P.Q.A.A. Several prominent aldermen were also interviewed and an endeavor made to enlist their assistance. So far, the only reply received is to the effect that your communication has been "laid on the table". We are again returning to the charge and do not intend to let the matter drop until a good decision has been arrived at. Considering the number of times we have approached the august body of our City Council, there is no danger of their being "blissfully unmindful" of our existence, at the same time I must acknowledge they have a "Nelsonian" faculty of directing their mental telescopes from their blind eye

Respectfully yours,

JOHN S. ARCHIBALD,
President Province of Quebec Assc. of Architects.

MONTREAL, December 12, 1905.

To the Editor CANADIAN ARCHITECT AND BUILDER.

SIR:—On taking up your November issue, I again find your Montreal contributor showing his extreme love(?) for the P.Q.A.A. by going out of his way to publish serious mis-statements in regard to its work—or want of work. I protest, in the name of our Association, against this tirade.

I presume, judging by his usual contributions, that our critic, behind the mask, is an architect, if so, I may further presume that he is a member of the P.Q.A.A.; permit me therefore to draw his attention to Article No. 9 in the Code of Ethics adopted by our profession at the Provincial Convention held that criticisms of professional work or conduct should only be indulged in "over his own name".

I do not wish to indulge in any controversy with your contributor as to what the P.Q.A.A. has, or has not, done, but if "Concordia Salus" will communicate with the Council of Association, they will be more than pleased to inform him of their movements, with the hope that your readers will thereby be entertained with facts—great or small, as the case may be—and not with a garbled account unworthy of the author.

I remain

Yours very truly,

JOHN S. ARCHIBALD,
President Province of Quebec Architects' Association.

Our Montreal correspondents' reply to these letters is contained in the MONTREAL NOTES of this number.—Ed.

TORONTO, December 1st, 1905.

To the Editor of THE CANADIAN ARCHITECT AND BUILDER.

(Copy of letter sent Secretaries of Architectural 18 Club, and Ontario Association of Architects.)

DEAR SIR,—The recent advance in the price of wood lath, affects our price-list in items numbered 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23, causing an advance of one and one half (1 1/2) cents per yard. Also in items No. 44 and No. 45, making price of lath $5.50 per thousand instead of $4.50 and 60 cents per hundred instead of 50 cents, as quoted in June last when our price-list was issued.

Would call your attention to the clause in our price-list stating that prices were based on existing cost of materials and labor at date of issue.

We have a committee in charge of this matter and should you wish any further explanation or discussion re same, we will be pleased to confer with you.

We have sent copies of our price-list annually to each practising architect, but on this occasion we are only notifying the secretary of each association, which we trust will be satisfactory.

Yours truly,

(Signed) WM. J. HYNES,
Sec'y Master Plasterers' Association.

THE R.I.B.A. PRESIDENT'S ADDRESS.

Mr. John Belcher in his presidential address at the opening meeting of the new session of the Royal Institute of British Architects, after speaking of Institute affairs and some London affairs, touched upon a topic (the Architectural Education of the Public) which is, one would think, a more necessary matter in this country than in England. There, some portion, at any rate, of the public has a knowledge of architecture and cultivated taste—the natural consequence of a leisure class of educated men and a country stocked with examples of good architecture. Here we have neither inherited wealth nor a heritage of architecture But we are beginning to take an interest in architecture because of the interest people take in their houses and in the cities in which they live. These are wholesome roots from which to grow architectural ideas, but cultivation is necessary.

The Education of the Public as a work for an architectural society has been spoken of, and indeed acted upon, to some extent, by the Ontario Association of Architects Their method of proceedure has been to invite the public to hear lectures [illegible] Apparently the R.I.B.A. is engaged in something of the nature of a popular treatise which it would be well to keep track of, to see whether it could not be made useful in this country also. We reprint Mr. Belcher's address from this point.

The International Congress, of which he speaks to be held in London in the latter end of next July is noticed in another column. A new contact of the mind of the profession in England, with the architectural world, may have [illegible] for it by this means, the contact of many minds at once with new ideas, that new ideas are speedily found to be "in the air", making their appearance in different parts of the country under impulses apparently, in each case, original. The occasion is pretty sure to chime with approaching development in some direction, for, so far as one can judge of what is of leading importance in one's own time, the subjects for discussion at the approaching conference seem to have been admirably chosen to cover all the ground that is of interest on in debate in the profession at present. One of these subjects of interest, the improvement of cities, is the theme of the rest of Mr. Belcher's address until he concludes, unexpectedly but with undoubted truth, by commenting (à propos no doubt of the movement to good cottage building) upon the advantage of beginning design with small problems which can be grasped so that the mind can work itself out in them.

The education of the public in the elementary principles of artchitecture claims our attention at the present time. I know that this idea is regarded by some as Utopian; but at any rate there is abundant evidence that people generally take

more interest in the subject than they used to. A recently-published handbook by Martin Buckmaster, though too archæological in character, is yet evidence of a demand for information and instruction of a popular rather than technical character. A committee was appointed last session to consider whether anything could be done in this direction and they came to the conclusion that certain proposals laid before them were not only practicable but capable of an extensive application. A "standard work" issued by the Institute, and directed not so much to the training of the professional student as to furnish information which might with advantage form a part of every educated person's intellectual equipment, would prove of use, not only to the public generally, but also to shool teachers and others interested in education. This question, "The Education of the the Public," together with that of a dipoma for architects; and the best methods to be adopted in the laying-out of cities, will engage the attention of the International Congress which is to meet in London in the third week of July in next year. This will be the seventh such congress, and the first held in London. On previous occasions, for the most part, the Congress has been aided by a State subvention, for foreign governments are alive to the importance of such events from the point of view of the national interest. Our system of goverment not allowing of such support, we are thrown back, for the success of the Congress almost entirely on our own enterprise and *esprit de corps*. An earnest appeal is therefore made to all members of the profession in this country to lend a generous aid in this matter, not so much by special donations as through the executive committee are by no means too proud to accept them, as by enrolling themselves members of the Congress, whether they see their way to taking part in it personally or not. If the profession generally give the committee their support, the committee will see to it that the Congress is not merely a success, but not in anywise inferior in dignity and interest to any that have preceded it. Other countries have heartily welcomed and hospitably entertained the delegates sent to them, and we must be no less generous in the reception of our foreign *confreres*, the delegates and others who are to honour us with their presence. The Institute is contributing £500; the balance — a pretty heavy one — must be supplied by subscription. A series of visits and entertainments is being arranged, and the committee are drawing up what they hope will prove a very attractive programme. When the time comes helpers will be welcomed. In particular the committee are anxious to enlist the services of any members of the Institute who may be conversant with [illegible] foreign language. Three or four gentlemen have already promised their services. We are looking forward to this Congress [illegible] something of the principles and practice adopted in other lands. We must, however, in comparing foreign methods with our own, take into account the patronage that the State in so many cases extends to the arts, and to architecture especially, abroad. Hitherto foreigners have taken but little account of our native architecture. It is only of late years with increasing facilities of travel and I may add, the improved relations with other countries which our gracious King and patron has done so much to foster, that discovery is being made of the many magnificent buildings scattered over the British Isles, many of them possessing a distinction and character not found elsewhere. In the sphere of domestic architcture particularly we can boast of much that excels anything else of the sort in Europe. From the mansion of the wealthy landowner situated in its own park to the homely cottage of the village labourer or artisan standing in a well-kept garden, often hidden behind the trim hedge of some picturesque lane, our rural landscape possesses a beauty and interest that cannot be surpassed. The atmosphere of peaceful repose in which our country towns and villages so often seem to be bathed—the effect of that reticence and love of seclusion which mark our countrymen—is a surprise, indeed, a revelation, to those who have only seen life under other conditions, and possesses irresistable charms and attractions for many who visit us from other lands. We ourselves have not shown due appreciation of these beauties of our native land. Not only are we, as a nation, fond of travel, but we are wont to extol everything foreign and depreciate everything that is our own. Foreigners, naturally enough, have taken us at our own valuation. It has been so in every department of art. Not until a man's work has been approved and commended by other nations is he recognized here as worthy of any honour. I anticipate that the International Congress will go far to open the eyes of the public to much in their own land that they have not hitherto valued at its true worth. Let us make every effort to welcome our colleagues heartily and to do them all the honor we can, and thus contribute to draw closer the bonds of international esteem and friendship which draws us to them.

I make no apology for bringing before you once again the question of our street architecture in its hygienic aspect. The appearance of our public thoroughfares is commonly regarded as a mere matter of taste, and is not believed to have any bearing upon the health or morals of the people. Last year I laid before you reasons for thinking otherwise, and I again press the matter upon your attention, because the proposals laid before Parliament by the Traffic Commission will, if adopted, afford a splendid opportunity for the application of better principles than have hitherto prevailed in this respect. The formation of new main arteries and the widening of important thoroughfares to provide greater facilities for locomotion and transport imply new building frontages. Let the lacades which are thus to be in the public eye, as it were, for many long years to come, be under proper control from the very first. The owners of land bordering on a public thoroughfare ought not to be at liberty to indulge an ill-regulated fancy for what is mean and false in architecture or vulgar and showy in appearance. [illegible] control set upon private caprice that our street architecture may be marked by that restraint, that unobstrusive simplicity, the result of serious and dignified thought, which may tend to produce like thought in the minds of those who look upon it. The formation and widening of main arteries in great cities has another aspect. The work no doubt is primarily undertaken to provide for the ever-increasing demands of the traffic; but incidentally it assists materially in bringing a proper air-supply to the crowded centre. The extension of the tramway system is driving from the suburbs many of the wealthier class who in the past have resided in suburban houses standing in many acres of land. [illegible] speculating builder, who is busy running up small houses crowded together into the minimum space permitted by the Building Act. Thus the supply of air to the central parts is being blocked in every direction by a zone of over-built suburbs, and the danger in case of an epidemic of a malignant character is increased most seriously. In some conntries—for instance, Germany and the United States—State interference has been invoked to regulate the "extension of cities," and I am glad to note that the authorities are seriously considering the advisability of similar legislation in respect of the suburbs of London. The attention of the public has been somewhat diverted from this larger subject to what is relatively a minor detail—viz,, the character of the small villa residences referred to; but the interest taken in the so-called "garden cities" is evidence of an awakening to the importance of a graduated increase of air-space in proportion as the buildings recede from the centre of the city. As Sir James Crichton-Browne said at the Sanitary Congress, "it is desirable that we should obtain control of the builder, and prevent the indefinite and unguided growth of the suburbs. We should then construct great leafy avenues, fine broad thoroughfares, stretching away into the immense ocean of beautiful air in the country."

The laying out of such avenues and thoroughfares is not entirely and solely a matter for the engineer and borough surveyor. The architect, and in certain cases the painter and sculptor, might with great public advantage be called in to collaborate with them. It is not the best way in such a matter to take an Ordnance map and rule a straight line from one point to another. Yet such is, in essence, the course frequently adopted; and should any important building or object of interest come in the way, the engineer's motto is too often like George Stephenson's in respect of the cow that somebody suggested might trespass on his new railway. There is a great deal more to be determined in connection with a new thoroughfare than the most direct route, the necessary gradients, the sanitary and hygienic requirements, &c.; there are artistic possibilities to be taken into the public service, such as the opening up of suitable vistas, the bringing into prominence of the screening of existing buildings, the slight turning from the straight line to heighten the effect, or provide places for carriages to stand out of the line of traffic. These and other expedients which have been adopted in some foreign cities with admirable results—as pointed out recently by Mr. John W. Simpson in his interesting paper on "The Laying-out of Cities"—all fall within the proper function of the architect. So, also, do the methods to be adopted in crossing squares and open spaces, and devices for lessening the points of collision from cross-traffic, to which he referred. With reference to divergence from the straight line, I may point out that though the method of straight lines and uniform buildings possess many merits, and should be rigorously insisted on wherever a dignified approach is demanded, or stately and official requirements render it obviously advisable, yet, to be effective, this style of treatment must be limited and kept within due proportion to the purpose, otherwise it ceases to be impressive. Mere repetition spells monotony, and a long straight street is appalling to the pedestrian, so that a break in the line of axis, such as a square or open space, is welcomed as a relief. It is often possible to introduce such features into a scheme with admirable effect and without breaking the line of route. These are some of the special considerations which would naturally be referred to the architect when associated with the engineer in the laying-out of new streets. The authorities need to be awakened to the fact that these matters have a commercial aspect which appeals to the practical mind. Art pays when properly handled. Not anything and everything that is labelled "art"; not the art which vaunts itself, but rather that which is concealed, the [illegible] sense of fitness, the art which, for instance, concentrates effects or subordinates parts in their relation to the whole; which seizes opportunities, or even difficulties, and turns them to effective account. In such wise can art bring enhanced value to schemes which would otherwise be merely utilitarian, and blank utilitarianism is apt to be disfigured by a brutal directness which is repulsive, or a bare and naked plight which is vulgar. In the absence of a minister of fine art with duly qualified advisers, an art commission similar to that which has been established in New York has been suggested. The commission referred to has jurisdiction over all designs of municipal buildings, bridges, approaches, gates, fences, lamps, the lines, grades, and plotting of public ways and grounds, arches, structures and approaches, and other similar matters. It must be admitted that such powers as are here indicated can only safely be placed in the best and most capable hands; for, alas! what frauds, if not crimes, are perpetrated in the name of art! False art has made many mistrust all art, and caused them to shut their eyes to the real value and influence of that which is genuine. I believe, however, there is a better time coming. It is noteworthy as one passes through the country what an increasingly large proportion of the smaller classes of houses have evidently been designed by architects. The builder is discovering that an architect's design is not an expensive and unnecessary luxury, but that the initial outlay is more than repaid if not in the actual building of the house—and this often happens—at any rate in the improved letting which results.

I cannot help remarking too, upon the advantage which accrues to the architect himself in the process of studying and designing small houses. It certainly is not very remunerative work, but it has its compensating rewards. Any real advance must no doubt begin in small things before there can be a true appreciation of greater work. As the true qualities of architecture should be equally seen in small as in large buildings, they may perhaps be more easily grasped and understood by way of less complicated problems. Increasing knowledge will add to the number of those who appreciate and desire good work, and their sensitiveness in matters of taste will incite the producers to higher efforts, so that by action and reaction our native art will approach a higher level. Let us seek not merely to fan the growing interest in our art, but also to awaken a clear perception of its true qualities. It will not be long, I venture to prophesy, before public opinion will declare itself definitely and decidedly, insisting upon grace and refinement both in our public buildings and our important thoroughfares. Given such an opportunity, we may feel confident that our national architecture will not fail under the test, but will reflect the highest and noblest qualities of our race.

FINIAL BY SIR ROWAND ANDERSON.

The finial illustrated below has been designed by Sir Rowand Anderson for the principal gables of the Sir William Pearce Institute at Govan. It was executed by Mr. Charles Henshaw, decorative metal-worker, of Edinburgh. As appropriate to Govan, renowned for its shipbuilding yards, the design takes the form of a ship, though an ancient example of Armada days has

been thought more suitable than a modern ship. It is fixed on a pedestal of stone and measures fully 6 ft. overall, with a width of 4 ft. 6 ins. At first the intention was to make the ship of cast bronze, but this idea was given up on account of the weight. Sheet copper was therefore chosen, which necessitated greater care and skill in construction. The framework is of wrought-iron, and every precaution has been taken to secure sufficient strength to withstand wind-pressure. —*Builders Journal and Architectural Record.*

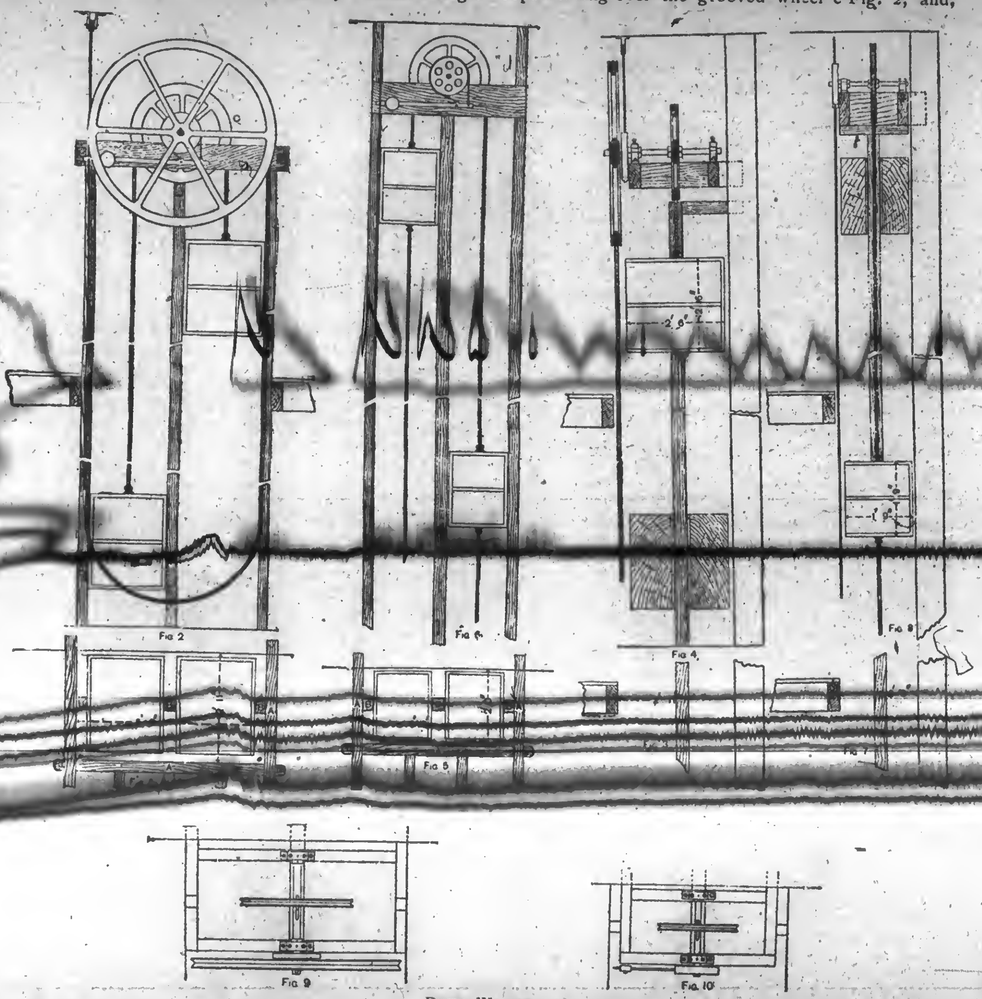
Seattle has accomplished the widening of a street without moving all the buildings which encroach upon the portion desired for street use—at least in theory. It is proposed to take nine feet from the property for street use, but the buildings now erected on each side of the street shall remain undisturbed so far as their upper stories are concerned, and the owners may make arcades over the nine feet of sidewalk, which must be taken from the lower stories.—*Improvement Bulletin.*

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "A Subscriber": I would very much like to know how to construct a dumb waiter, suited for a private dwelling with, instructions how to build same, and how to install?

Ans.—"A Subscriber" does not say whether a single or double dumb waiter is required. However, the construction is about the same in both cases, only, that in a single waiter, a weight is used on one side instead of a cage or cupboard, and on this account the space occupied by the weight may be much smaller than if a cage is employed. In order that "A Subscriber" may have a choice of design or styles, two different styles of waiters are shown. Where quick handling and ease are desired, Figs. 1, 2, 3, and 9 may be studied for constructions and arrangement of parts. Fig. 1 shows the trimming required for the larger waiter. The size in the clear is 5 ft. by 2 ft. 11 in., but these dimensions need not be followed if too large or too small. The guides A, of 4 in. by 4 in. fir, are fixed to trimmers B, as shown in elevation (Fig. 1). The size of the cages is 2 ft. 6 in. by 2 ft. 6 in. by 2 ft. (see Fig. 2). They are dovetailed together, and have a shelf fixed in the centre. They are suspended from a rope running over the grooved wheel c Fig. 2, and, being of equal weight, are evenly balanced, Fig. 6. The hauling wheel is 4 ft. 9 in. in diameter, the rope wheel, c Fig. 2., 2 ft. 4 in. in diameter, so that the rope at each side hangs directly over the centre of the cage. Both the hauling and the rope wheel are fixed to a piece of horizontal steel shafting running in metal bearings, with self-feeding lubricators. The brake wheel is also fixed to the shafting between the hauling



Dumb Waiter.

Figs. 1, 2, 3 and 4.—Plan of Trimming, Elevation, Sectional Plan, and Sectional Elevation of Double Division. Figs. 5, 6, 7 and 8.—Plan of Trimming, Elevation, Sectional Plan, and Sectional Elevation of Light Double Waiter. Figs. 9 and 10.—Plans of Hauling Apparatus.

wheel and bearing. The band brake works from a centre, as shown Fig. 2, 4, and 6, and is put into action by the pulling of the cord at the left hand.

The smaller waiter, Figs. 5 to 10, is similarly constructed, except that no hauling wheel is required, the cages being moved up or down as desired by pulling the cord suspended below each cage, Figs. 6 and 8. The figures not mentioned in the text are sufficiently explained. A small dumb waiter can be made in a space not more than two-feet ten inches long by two feet wide, if a weight is used to balance the cage. The floor through which the dumb waiter passes, should be well trimmed in the same manner as a stair opening. The guides as shown in the illustration need not be more than 3x3 inches thick, but must be straight and true to allow the cage to move freely up and down. The running should be cased in with one inch matched boards. If a weight is employed on one side, it should be of cast iron and should have an eye bolt in the centre of its lower edge, so as to allow a pull down rope to be fastened to it. The empty cage and the weight should balance.

From "Builder" will you please inform me how a brick house may be made damp-proof by coating it with some wash, or other material and oblige?

Ans.—Brick may be made temporarily water or damp-proof by painting, tarring or waterproof washes; as applied to finished wall surfaces, but after all, there is no certainty that any application of either paint or wash, will prove effective. Walls may be coated with asphalt, lime, or cement mortar made with half Portland cement, and half sand, will do very fairly, but are not in the end to be relied upon. A facing of non-absorbent [illegible] cement, good hydraulic mortar, may be sufficient in some cases. Sometimes brick walls are faced with glazed brick or tiles, or, where appearances is no object, with slates to keep out the weather.

In order to keep damp from soaking up into the walls of buildings from the foundations, a horizontal damp course is placed [illegible] level of the lowest floor [illegible] should run on

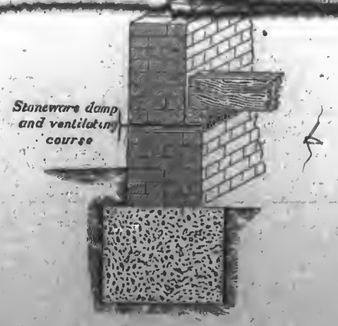


Fig. 11.

the footings, etc., in contact with the ground, from the wall above. It should be at least 6 inches above the highest level of the soil touching any part of the outer walls, and should run unbroken all round them, and at least 2 feet into all the cross-walls; but on a damp site it should be continuous through all the walls, and in some cases a damp-proof layer may be required over the entire area of the building.

In buildings finished at the top with parapets, in place of overhanging eaves, it is often necessary to insert a damp course just below the parapet and above the top ceiling level, to prevent the downward penetration of damp, or there should be coping stones or other covering for the brickwork to prevent wet from getting into the wall.

Damp courses are formed of various materials, such as: Sheet lead, which is efficient but costly. Glazed stoneware perforated slabs, generally made in thicknesses of the bricks used, same as shown in Fig 11. Slates are used often with success, and in costly buildings, copper is sometimes used. A good method of preventing damp from being drawn up into the wall from below, is to form what is termed "a dry area," where the earth is kept away from the wall by merely building up rough clinkers or dry stone packing against it; in other cases a 4½ in. brick wall is built up 4½ in. from the main wall, resisting the earth pressure by means of headers merely butting against the wall; the butting headers may be dipped [illegible] As to check the passage of damp, [illegible] soft [illegible] bricks may be used for the purpose: and the detached skin can be carried a little way above the ground and treated as a base or plinth course.

In localities where stone or slate slabs are abundant, a dry area formed of slabs leaning against the face of

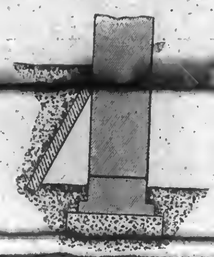


Fig. 12.

the wall, as shown in Fig. 34, will often answer the purpose.

From "Carpenter": How can I prevent sounds from coming through a floor to the rooms above?

Ans.—Sound that readily passes through a floor may be minimized in one of the following ways or by a combination of them; 1. The use of separate ceiling joists kept clear of the bridging joints, or attached only to every fourth or fifth of them; 2. Inodorous felt may be nailed on the back of the bridging joints under the floor boards; 3. Sound boarding and pugging may be used. This is shown in Fig. 13 A, where rough (i.e. unplaned) boards, ¾ in. thick, are supported by fillets 1¼ in. square, nailed along the sides of the joints, and on this is laid a layer of plasterer's coarse stuff, about 3 and 4 inches thick, or loose slag wool (also called silicate cotton.) The latter is the better material for the purpose, as it is less likely to produce dry rot. It is laid to a thickness of about 1½ inch so as to fill the cavity between the sound boarding and the floor-boards. 4. Slag wool may be obtained sandwiched between wire netting in slabs 1 inch thick; these may

be attached to the underside of the joists with wire staples. The surface is then brandered i. e. battens, say 2 inches by 1 inch, are nailed along the under side of the joists to receive the plasterer's lath. The third

FIG. 13.

and fourth of these methods may be used together with very satisfactory results. If the slab is made with metal lathing on the underside, brandering is not required, and the plaster is laid direct on the metal. The use of the slag wool in this way renders the floor to some extent fire-resisting.

RE-ENFORCED CONCRETE CONSTRUCTION

A paper on the above subject was read by Mr. André Loignon before the Province of Quebec Association of Architects and was followed by a general discussion. Mr. Loignon said that the system of construction in re-enforced concrete had been extensively used in Europe during the last 25 years and had been coming into vogue on this side of the Atlantic. The advantages claimed for the system were its fire-proof quality, its monolithic quality, absence of vibration, power of resisting shocks, reduction of dead weight and the convenience of direct plastering. In the great fire of Baltimore re-enforced concrete proved its excellence under fire.

In the complete acceptance of the system the ordinary I beams are replaced by re-enforced concrete beams usually of a bar stirrup construction, and in designing such beams it must be remembered that the elasticity of the steel is ten times that of the concrete, and these qualities of the two materials should be so proportioned as to break at the same tension; and consideration must more especially be taken into account when high tension steel is to be made use of with advantage. In addition to the ordinary problems of tensional and compressional stresses, the tendency of the bars to slip or slide in the concrete is a circumstance to be provided for. Plain round bars are of course the cheapest and most easily obtainable, but special twisted and corrugated bars are on the market. The tendency to slip may be averted by properly anchoring them at the ends and it should be borne in mind that a number of smaller bars will often be of more advantage [illegible] bars of larger size, though in sectional strength they may be the same. Thus seven ¾ inch bars having about one-third greater [illegible] surface than four 1 inch bars, offer more resistance to sliding, though the latter have a slight advantage in sectional area.

Precise theories for the calculation of re-enforced concrete beams have not yet been established. The French Government is at present making experiments with a view to arriving at precise data. Meanwhile the formulæ given by Christophe and others are sufficiently accurate for general purposes.

Correct proportioning of the constituents of the concrete and careful workmanship are essential. The best cement should always be used in this class of work and machine mixing is of the greatest advantage. The concrete should be kept damp for 3 or 4 days after being laid and the centering should be allowed to stand for three weeks. Cinder concrete varies greatly in strength but is in general much inferior to that made with stone aggregate. Re-enforced concrete should not be made in frosty weather.

In the discussion which followed Mr. Amos, Mr. Beullac, Prof. Nobbs, Mr. Archibald and others took part. In answer to questions, Mr. Loignon expressed the opinion that the fact of bars being a little rusty was no objection to their use. Further oxidisation was effectively checked when the rods were embedded in concrete—except indeed in the case of cinder concrete—and a slight rustiness aided the adhesion of the cement and tended to prevent slipping. As to the possible span of re-enforced concrete beams he knew of one case in which such a beam carried a music-hall gallery over a span of 60 feet, and a roof beam had been made 102 feet long. In these cases provision had of course to be made for expansion and contraction. The monolithic nature of expanded metal necessitated special rigidity of foundation; but this was the less difficult of accomplishment when the comparative lightness of re-enforced concrete walling is remembered. The lecturer cited a case at Keewatin in which masonry walls 8 feet thick had been replaced by re-enforced concrete only 22 inches thick. Such work could moreover be made practically waterproof.

PAINTED SPRINKLERS.

By JOHN EDWIN CURTIS.

A paper read before the Underwriters Association of New York State.

The increasing popularity of the pneumatic whitewashing machine as a cheap and effective means of cleansing and brightening the interior of factory buildings and at the same time providing a slight fire-resistive covering for woodwork, is welcomed alike by assured and underwriter; but if risk be protected by automatic sprinklers, a serious condition may arise from its use unless proper precautions are taken the protect the sprinkler, heads from being coated also.

Before using the pneumatic whitewashing machine, each sprinkler head should be thoroughly covered with cloth or paper: too little care has been taken regarding this in the past with the result that many sprinkler heads are found splashed, partly coated or thoroughly coated with whitewash. But this machine is not responsible for all coated sprinklers; in many cases orders are given to paint the sprinkler pipe to harmonize with surroundings or resist corrosion, and the painter, through ignorance, applies the paint to the sprinkler heads also.

The most effective and in many cases the cheapest way to rectify such a mistake is to replace the coated heads with new ones, because in attempting to remove the whitewash, or paint, the [illegible] weakened or the fusibility of the solder impaired. Sprinkler companies will replace the old heads for about one-half the cost new ones.

It is well known that whitewash and other mineral paints are insulators of heat to a greater or lesser degree, and as nearly all paints contain mineral pigments the extent of insulation depends on the thickness of the coating and the amount of mineral pigment contained. [illegible] fusible solder with a melting point of 155 to 165 degrees Fahr., and under normal conditions will open at approximately those temperatures, but when coated with whitewash or paint their efficiency is impaired or destroyed and they are converted into high test heads without any known fusing point, which may not open except under a direct flame.

To coat sprinkler heads in this manner may mean to invite disaster, since, before the temperature is reached on the ceiling at which a high test head will open, the fire may have swept beyond its radius of action and by continuing to open more heads cause unnecessary water damage or possibly exhaust the water supplies and result in a sprinkler failure.

A similar condition may be brought about by corrosion of sprinkler heads due to the presence of certain acids or alkalies, the latter tending to granulate and harden the solder, but this condition may be obviated by substituting "corrosive-proof" heads, supplied by all reliable sprinkler companies.

At the low rates prevailing on sprinklered business it can readily be understood that an underwriter cannot afford to have so uncertain a factor as a coated sprinkler to exist in a risk insured by him.

The Underwriters Association of New York State have issued a circular to each sprinklered risk under its jurisdiction, urging that all coated sprinklers be replaced at once and proper precautions taken in the future when whitewashing or painting is to be done.—*Insurance Engineering.*

MONTREAL NOTES.

About two years ago Mr. Carnegie offered Montreal the sum of $150,000 towards establishing a public library. After a lengthened and spasmodic discussion of the question the City Council decided, on the 27th of Nov. last, that the offer should not be accepted, on the ground apparently that the annual expense involved would be too great and might be applied in better ways. It was Carlyle we believe who pointed out that we seem to be able to afford jails for all our great cities, why not have public libraries instead; the suggestion being that in reality we had here two alternatives to make choice between, and that in a progressing civilization the public library would do away with the necessity for the jail. The golden age is not yet it seems.

"In an address to the Art Association of Montreal Prof. Nobbs of McGill University made an appeal for the establishment of a Museum of Industrial Art with a view to improving the standard of Canadian productions and, in order no doubt to commend such a scheme to a city which will not accept of public libraries, he points out that there is money in it. The idea is one which all interested in good or artistic workmanship would willingly see realized. Meanwhile however we make a little step forward in equipment for industrial arts, for, on the [illegible] Lord Grey laid the foundation stone of the new Commercial & Technical High School, which is to be built on the north side of Sherbrooke Street between St. Famille and St. Urban Streets. The purpose of this school, as expressed in the address to His Excellency on the occasion, is to "send forth its alumni year by year endowed with breadth of idea and skill of hand to take their places with credit in the great world of commerce, design or construction."

At a City Council meeting, on the 20th of November, a by-law was passed to the effect that "every new building erected on the lots fronting on either side of Ontario Street shall not have less than three stories." This must be characterised as a careless [illegible] result of by-law enforcement would be that an owner, having the intention to build two stories of substantial character would be compelled to build three stories; and, if in doing so he lowered his standard of building to the minimum required by law, one could hardly blame him. Such unsatisfactory by-laws might very readily be avoided by the establishment of a definite connection between the City Council and the Province of Quebec Association of Architects, the want of which has time and again been deplored in these notes. Some remarks of more than usual and perhaps regrettable bitterness on this point have called forth a couple of letters from the President of the Association, published on another page, to which we are glad to draw attention. These letters demonstrate that, whilst little or no information about it has been leaking through to the general public, the Council of the P.Q.A.A. has been actively if vainly endeavouring to achieve something in this matter; and they effectively shift much of the blame on to the shoulders of the City Council which has the nonchalance to say in reply to important communications that they have been 'laid on the table'. Now the general position in this matter of the writer of these notes has been to point out not that the Council of the P.Q.A.A. do not do their work, but that the P.Q.A.A. itself does not carry weight in public matters; and the general line of argument has been that it fails to do so by not appearing as a body to interest itself sufficiently in the public's affairs. The blame for such a state of things by no means rests with the Council but primarily and essentially with those members who when the Association holds its meetings do not turn out to them and so give weight and value to its proceedings. When lately a paper on a most interesting subject, that of reinforced concrete, was read before the Association by Mons. André Loignon, the meeting was not as large as it ought to have been, and it is this sort of thing that keeps the Association in its present disintegrated state. The want of loyalty which keeps members at home on these accasions is the fatal weakness. It will generally be found that the busiest men are those who find time to be present. Unfortunately, when one grows indignant at such a state of things, the only persons likely to take such indignation seriously to heart are those who are clear of all blame, as in this case the President and Council of the P.Q.A.A. Let the meetings of the Association be heartily supported and we shall soon hear of its receiving more respectful consideration. Mr. Archibald hit very hard but I hope to live long enough to see him write of my 'love' for the P.Q.A.A. without any (?) after it.

The following extract from a witness' interviews with the City Building Inspector throws a certain side light on the relation between the Association and the City. "Mr. Chaussé referred to the request of the Province of Quebec Association of Architects that whenever permits for buildings are granted blue prints of the plans should be lodged with the Building Inspector. The City Council refused to do this a month ago remarked Mr. Chaussé, yet it ought to be done, and is done in every other city . . . . . We have a vault here which was specially built for filing such permits but up to date there is only one plan in it. That plan was made by a firm of United States architects, who thought the [illegible] here was the same as over there, and [illegible] lodged a plan when they put in their application for a permit."

[illegible] is announced as being in preparation by Alderman Lavallée, chairman of the Annexation Committee. This is no less than a project to have an avenue laid out 300 ft. wide and 35 miles long, extending from Bout de l'isle to St. Ann's and traversing the axis of Montreal Island with building lots 300 feet deep on each side. The success of the scheme to depend on the sale of these lots. The scheme is a magnificent one but the present fashion when any one wants a lot in the country is to have one by the lake or riverside, and there does exist at present all around the island not indeed a 300 feet avenue but at any rate the best made and most delightful road in these parts. Three hundred feet wide is splendid but is it a really handy width?

Another scheme, which seems more likely to take practicable shape within measurable time, is that of the establishment of another amusement park by the Dominion Park Co. at Longue Pointe, which it is hoped to open by the 24th of May next.

It is now announced that the work of demolishing the Windsor Hall will be commenced about the middle of March next. This is to make way for the great ex-

tensions to the Windsor Hotel. For this Messrs. H. J. Hardenbergh & Bradford L. Gilbert, of New York, are named as architects.

The new armory for the Royal Scots is now well under way and the work is being pushed forward with great activity. Messrs. Finlay & Spence are the architects.

CONCORDIA SALUS.

THE SKETCH CLUB P. Q. A. A.

An exhibition of measured drawings was held, in connection with the above club, on the 15th of November. The drawings were made in competition for a prize of $40 offered to the member who could produce the best evidences of study of the old architectural work in the Province of Quebec or the Eastern Provinces. About fifty drawings were exhibited by six members of the Club. Prof. Nobbs who had offered the prize criticised the work done and announced the award. The prize he said had been well earned by Mr. D. Hardie, who with twenty-three drawings had given evidence of praiseworthy zeal, and whose drawings themselves testified that their author had in the course of the work made a distinct advance in draughtsmanship. Other students submitted smaller quantity of work but in several cases which he called attention to had produced drawings of superior draughtsmanship. He would like he said to present a second prize, but had not been able to make up his mind to which of the competitors it should be awarded. He would therefore ask the meeting to make a selection by ballot. This was done with the result that the second prize was awarded to Mr. J. Roxburgh Smith for his exceedingly well drawn set of six drawings. Among the buildings illustrated by the exhibition were the Arts Building of McGill University, the Seminary of St. Sulpice, the Churches of Notre Dame de Pitié and Notre Dame des Anges, besides a number of the old houses of Montreal and the vicinity.

On Wednesday, 22nd November the weekly meeting of the Club was occupied with a sketch design competition under Prof. Nobbs' direction. The subject set was "A Waiting Fountain in a city, the cost to be $100 dollars" the time limit for the competition was 1½ hrs. At the meeting of 13th December the first place was adjudged to Mr. A. J. King. At the meeting of November [illegible] from the secretary of the P.Q.A.A. announcing that the Association offered $25 towards a prize in the monthly competitions. Votes of thanks were accorded to the P. Q. A. A. for their generosity, and to Prof. Nobbs for the prizes he had given and the work he had done in connection with the measured drawings competition. The designs in the first monthly competition, six in number, were then exhibited and criticised in detail by Mr. W. S. Maxwell, the subject was an "Architect's Club". The first three competitors were placed as follows: 1st A.J. King, 2nd G. D. Ritchie, 3rd Louis Labelle.

The lecturer of the evening, Mr. William Haldane, then proceeded to give a review of the work by J. A. Gotch on the "Early Renaissance in England." The work was analyzed chapter by chapter, and a number of lantern slides further illustrated the subject.

On the 6th of December the Club listened to a charming discourse by Mr. Jos. Venne on the "Gothic Art of France." Mr. Venne said he had proposed as his subject the title announced in the notices sent out by the Club, "An Excursion in the Library," with the intention of following out an idea that had occurred to him some time ago when, in looking over the volumes in the library, he had in imagination renewed so many delightful acquaintances, heard again the still youthful voices of men whose names had now stood long among the standard authorities. In the actual preparation of this paper, however, he had been fascinated by one volume in particular, which, with its stores of information and delightful illustrations lying in its quiet corner of the library, reminded him of a cobweb covered bottle of champagne. This book was L'Art Gothique by Louis Gonze, and the lecturer proceeded to give a detailed appreciation of the work, dwelling at length and with enthusiasm on special points such as the Abbé Suger's share in the erection of the Cathedral of St. Denis which though not, as had at one time been claimed for it, the starting point of Gothic Architecture was at any rate a capital document in the history of its early development. The analytical method of Jean Letevre Pontalis for determining the chronological sequence of buildings in circumscribed districts was explained. It was shown how the advance in sculpture kept pace with the advance of gothic construction, how great and lasting was the achievement of the great cathedral builders of the end of the 12th century.

In conclusion Mr. Venne described the album of Villard de Honnecourt, a traveller of extensive accomplishments, who traversed France from north to west in the years 1243-45 and whose sketch-book is preserved in Paris at the present day. This with the treatise on the crafts of his day by Theophilus, a monk of the twelth century, form the most important records we have of mediaeval technical processes.

MONTREAL BUILDERS' EXCHANGE ANNUAL BANQUET.

The Exchange and their guests, numbering altogether 160, met in the banqueting-room of the Place Viger Hotel on Dec. 7, and carried out a dinner according to the following specification.

SPECIFICATIONS of Materials to be supplied and labor to be [illegible] at the Annual Banquet of the Builders' Exchange, [illegible] Evening, December 7th, 1899.

FOUNDATIONS—Oysters, malpecques on the half-shell. To be bedded on an undisturbed stomach.

GROUTING—Soup. Consommé à la [illegible]

COURSING—Fish. British Columbia Salmon, Pommes Rachel. To be of a rich portage entry color.

BOND TIMBERS—Cutlets of Sweetbreads à la Victoria.

JOISTING—Bread and Butter Rolls. To be laid on bond timbers and properly bridged, and to be covered diagonally with Butter (nut), knots less than 1½" allowed. Hair joints will not be required in this flooring.

JOINTS—Roast Young Turkey. Properly trussed and braced and strapped at angles with ½" × 3" Cranberry Sauce straps.

Ribs of Beef au jus. To be laid up and neatly pointed with Horse-radish, with not more than six joints in 12".
Note—Carving to be executed by experienced workmen, and to detail.

PLASTERING—Mashed Potatoes. Best 3-coat work, corners to be neatly rounded.

Brussels Sprouts au Beurre. French Green Peas.

ROOFING—Material to be Haunch of Venison, made secure with good roofing composition of Red Currant Jelly. Water Cress. To be rendered weatherproof by a thorough application of best mastic(ation).

French Lettuce Salad, French Dressing.

DESSERT.

TRIM—Unless where otherwise specified, to be clear pine, spoon cleaned, and principal rooms to be for enamel finish a nice cream. (Harlequin Ice cream).

HEARTHS—To be of assorted Cakes and Wafers with a border Bon-Bons and Chocolates.

HARDWARE—Except bolts (Nuts and Raisins) to be supplied by proprietor, but put in place by contractor.

DECORATIONS—The dining room to be frescoed with Apples, Oranges and Bananas.

GLAZING—To be best cut glass lemon(ade) color. Any glass of other than this color brought on the job will be entirely at contractors' risk.

TILING—To be best brown glazed Spanish (T and Coffee) make of tiles, finishing at ridge with tooth pick ridge-roll to special detail.

EXTRAS—Are to be paid for when ordered. G. H. Mumm & Co., Extra Dry.

Note—This work must be strictly carried out according to details, which will be supplied by architect, after the completion of work.

This however was not the whole business of the evening. A toast list followed and speeches by Mr. N. T. Gagnon, the President, Mr. E. M. Roberts, the Vice-President, by Messrs. J. W. Hughes, W. E. Doran, Ex-Ald. Charpentier, C. H. Catelli, Vice-President of the Chambre de Commerce, James Simpson, G. H. Hood, John S. Archibald, President of the the Province of Quebec Association of Architects, Professor Percy S. Nobbs of McGill University, Messrs. Joseph, J. H. Lauer Secretary of the Exchange, George Hadrill on behalf of the Board of Trade, J. W. Arcand, Secretary of the Painter's Association, J. Thibault, President of the Plumbers' Association, J. Lefebvre, President of the Plasterers' Association, John Duthie, for the Granite and Marble Employers, and W. B. Shaw, for the Electrical Association.

Between the toasts there was music; Songs by Messrs. F. H. Cowen, D. McGill and J. Penman; Concertina selections by Mr. Gray, and violin solos by Owen Page.

SYNOPSIS OF ADDRESS BY J. S. ARCHIBALD IN REPLY TO TOAST OF "PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS."

After thanking Builders' Exchange for heartiness displayed in the drinking of the toast, which spoke well for the happy relationship existing between the two [illegible] A public duty which all incorporated bodies and associations owed to the public and public interests, such duty to the public interests must be kept more strongly in view than the individual benefit to be derived by the units composing such Associations. The speaker questioned very much whether we were all recognizing that duty and living up to its dictates. Whilst something has been done, much more remains to be done.

"One question calling for immediate attention is the technical education of a mechanic. Very little is being done in this respect. He is being allowed to pick [illegible] I recognize with pleasure the work being done by the [illegible] but this should only be an impetus to urge us on to better things. It is necessary for the healthy development of the young man that he receive a training independent of that which he receives under an employer."

"Workshop influences do not conduce to the highest development of man; there being industrial as well as economic reasons which make it impossible to expect the employer to give his best attention to the progress of the apprentice."

Mr. Archibald considered it was the duty of the Government to assist the movement in a stronger manner. "It is the duty of the state to foster and develope all interests which make towards progress and prosperity. The government has already recognized that duty in the elementary and secondary education of the young. The speaker called for the combined action of the government, the city and all corporations who would benefit from a better condition of affairs, so that each and all might take their share of the work to be done in order to place at the disposal of our young men, means whereby they may attain to high position in the vocations they select."

The speaker next touched on the question of fire insurance and the high rates being charged in an city, and spoke as follows:—

"Discussion is ripe in these days respecting the necessity for larger water mains, increased water pressure, and additional fire-fighting appliance. The Underwriters are fighting with the city and vice versa. It is the duty of those of us whose daily occupation it is to erect those structures which are at the bottom of the whole trouble, to agitate for an improvement in these conditions which at present lend themselves as a cloak to the Insurance Co's."

"What is the use of crying for such improvements in our water and fire fighting services when a man can erect any old fire trap he likes in a city; when a man can erect on Notre Dame Street, right in the heart of our city, a building three stories high the front of which is constructed entirely of wood and covered with galvanized iron. In that building we have a standing monument to the inadequacy of our building bye-laws. These building bye-laws are at the root of the whole question. Such buildings should be made impossible. The building inspector was appealed to in this matter but he quotes the bye-laws which permit the erection of such a building 'covered with uncombustible material.' These bye-laws must be completely overhauled and remodelled. The P.Q.A.A. have been appealing to the City Council for such a remodelling but with very little success so far. We also claim that any amendments to the building bye-laws should be submitted to the Association before placing them before Council. We have succeeded in having this principle adopted, in part, by the Fire and Light Committee only "last week." These bye-laws must be improved along fire retarding lines and all our influence must be brought to bear at the proper quarter, to gain this much desired end.

"So far so good as regards the City's duty in the matter, now as regards the Underwriters. Improved conditions in the building bye-laws are all very good, but that is not sufficient, something must be done on the other side.

"At present the Insurance Companys do not encourage the erection of good fire resisting buildings in a city. For them to plead building bye-laws is beside the question, they should be in the van, encouraging by means of adequate reduction in rates, the erection of buildings according to fire resisting methods.

"This is a matter of fact world and with little room for sentiment and tradition. Architecture is a nice word for the university, but in everyday life it means the materialistic investment of filthy lucre. Utility, economy and profit are the watchwards.

"The first duty an architect is called upon to fulfil is to prove to his hesitating client that the money he invests to invest in a building will assure him a good profit. Anything that does not lend itself to this must be eradicated. If we suggest improved methods of building we must show adequate financial compensation. About the only financial compensation we might enlarge upon is that of reduced insurance rates; but we receive very little encouragement from the Insurance Co.'s on that score. They (the underwriters) will tell you they have, what they dignify by the term 'specific rating.' The underwriters of Montreal don't know what 'specific rating' is, or if they do, they fail to apply their knowledge in a way to be beneficial to the community.

"They have a few general phrases which seem to them to fully particularize the component parts of a building, but they are applied in such a manner as to be useless. The fact of the matter is that specific rating in Montreal consists of the amount of influence you can bring to bear at the proper quarter in order to obtain a reduction in the prevailing rates. We must combine to compel the Insurance Companies to get into line on this matter, and this along with improved building regulations will aid considerably towards that much desired goal of lower Insurance rates and reduced fire-losses.

"Both tasks are large but for that very reason should be inviting. Let us all take up our responsibilities and duties as members of associations and citizens of a city which is only now in the making. What it will be in the future, depends upon our present actions. Let no spirit of selfish aggrandisement blind our eyes to the possibilities and opportunities of the moment."

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this Journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	S. G. CURRY, "
2ND VICE-PRESIDENT	W. A. LANGTON, "
TREASURER	HENRY SIMPSON, "
REGISTRAR	W. R. GREGG, 95 King St., Toronto

COUNCIL.

A. W. SIDDALL	Toronto
JOHN GEMMELL	"
J. WILSON GRAY	"
JOHN E. BELCHER	Peterborough

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	[illegible], Quebec.
1ST VICE-PRESIDENT	ALCIDE CHAUSSÉ, Montreal.
2ND VICE-PRESIDENT	E. MAXWELL, Montreal.
SECRETARY	J. E. VANIER.
TREASURER	D. R. BROWN.

COUNCIL.

H. W. DAVIES	Montreal.
L. A. AMOS	Montreal.
J. Z. RESTHER	Montreal.
J. R. GARDINER	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

JOHN HOLDEN, President.
GEORGE DUTHIE, 1st Vice-President.
JOHN MALONEY, 2nd Vice-President.
JAS. CRANG, Treasurer.
T. MARTIN.
CANNON, Jr.
R. G. KIRBY.
A. MARSHALL.
GEO. GANDER.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

HENRY STRATFOLD, President.
GEORGE C. YOUNG, 1st Vice-President.
JAS. S. LUNNY, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.
J. JONES.
ED. MARTYN
JNO. WHITTAKER.
L. H. MARTYN.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.
H. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADERT.
C. P. SHINDLER
K. M. FRASER.
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BUREAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms.
Directors: F. G. Latimer, E. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alaip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girolin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAHEE, Hon. Treasurer.
J. HERBERT LAURE, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS
JOHN GRAY.
GEO. H. HOOD.
Past Presidents

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
H. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

TORONTO MASTER PAINTERS' ASSOCIATION.

At the regular meeting on Nov. 22nd. the following officers were elected: President, Mr. W. J. Bolus; 1st vice-president; Mr. Jas. Phinnemore; 2nd vice-president, Mr. J. W. Mogan; sec'y-treas., Mr. Stewart N. Hughes. Executive committee, Messrs. Jas. Casey, R. Wood, Albert Philips, J. B. Thompson, H. W. Johnston and the past presidents. Auditors, Messrs. J. W. Knott, and F. H. McCausland. Trustees, Messrs. J. W. Knott, W. J. Bolus, Stewart N. Hughes, J. M. Faircloth, and H. F. McCausland.

PERSONAL.

Mr. W. N. O'Neil, of the firm of W. N. O'Neil & Co., Vancouver, B.C., is at present on a visit to Eastern Canada.

Mr. Edward Copping since his retirement from his position in the Toronto municipal department of building recently has been presented by his friends in the civic service, with a leather-covered arm chair and a gold headed cane. Mr. McCallum, the city architect, in making the presentation on behalf of the department, wished Mr. Copping a long enjoyment of the ease which the gift symbolized.

The best and rarest moral bracer in the world is the knowledge that some one has faith in you.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

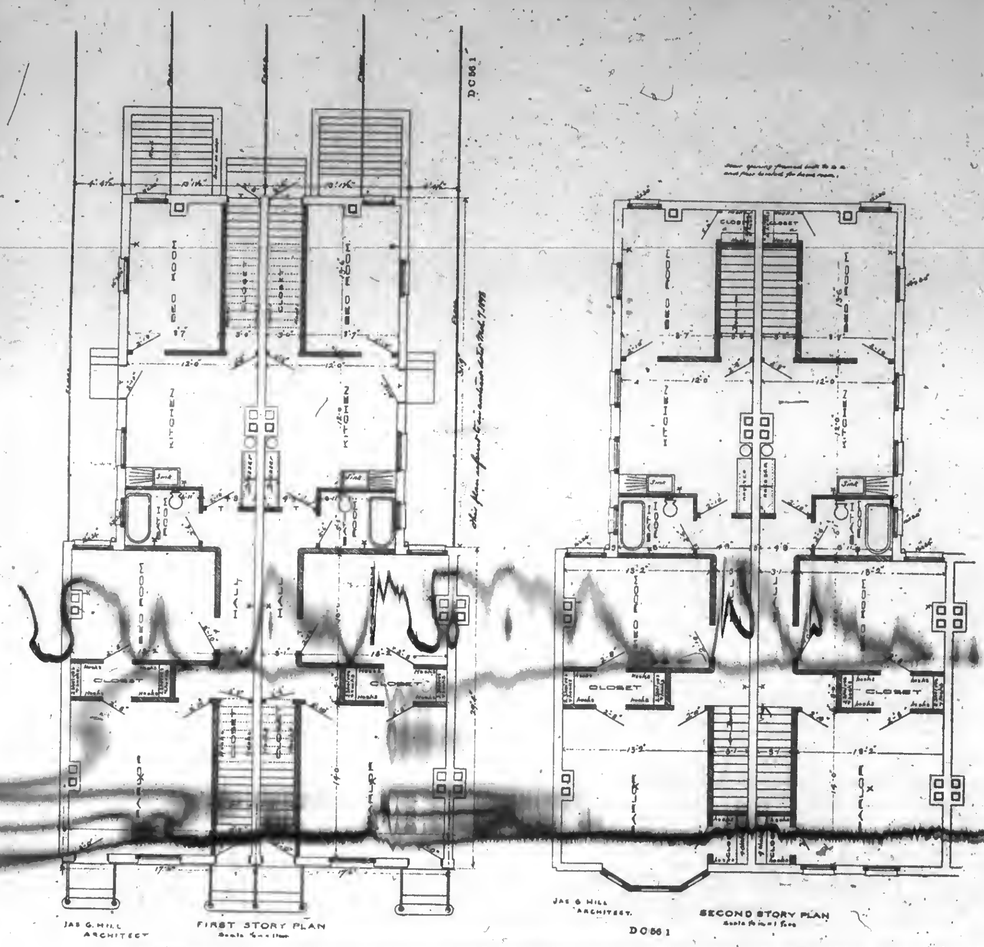
Kindly Write for Prices

CHURCH OF S. MARY, TORONTO.

THE LATE JOSEPH CONNOLLY, R.C.A., ARCHITECT.

VIEW FROM THE SOUTH-WEST.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1905



APARTMENT HOUSES BELONGING TO THE WASHINGTON SANITARY IMPROVEMENT COMPANY, WASHINGTON, D. C.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1906

CHOIR SEATS, BY C. A. VOYSEY.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1906

CHURCH OF S. MARY, TORONTO.
THE LATE JOSEPH CONNOLLY, R.C.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1905

CANADIAN

ARCHITECT AND BUILDER

VOL. XIX

INDEX

Air, Night 106
Apprenticeship Problem in the United States, The 153
Architects, A Novel Association of 44
Architects, A Statutory Qualification for 138
Architects, The Seventh International Congress of 123
Architectural Association, Western Canada 105
Art and Architecture 43
Architectural Refinements 1
Architecture, Signing 2
Art Commissions, Permanent 3
Architectural Acoustics 3
Architectural Directory 1-ii
Architecture, A Dream in 1-xi
Art, To Encourage Native 2-xiv
Architectural League of America. 34, 4-ix
Architecture of European Capitals, The 38
Art Museum, The Toronto 50
Architects' Offices, Situation of 69
Architects, The Specification of. 87
Arts and Manufactures, Council of 104
Architects of Alberta 7-xi
Architects' Congress, The Seventh International 118, 150
Architectural Club of Regina, Sask. 128
Architects' Plans, Duty on.....8-xiii, 148
Advertisement Designs, Competition for 159
Architectural Training in Montreal 159
Architectural Failures 10-xii
Architect's Drawings, The Ownership of 11-xii
Architecture of European Capitals, The Official 38
Architectural Eighteen Club of Toronto. 12-ix

Billboard Malady 16
Rapid Building 2-ix
Building Exhibits, Permanent 88
Boilers, New Light on the Care of 33
Builders' Exchange, Montreal, Que. 46, 56, 8-ix
Books: Code of Building Laws by Alcide Chausse 9-xii
The Business of Contracting, by Earnest McCullough 51
House Hints for Those Who Buy, Improve or Rent, by C. E. Schermerhorn 52
Trussed Roofs and Roof Trusses, by F. E. Kidder 52
Crematoria in Great Britain and Abroad, by A. C. Freeman.. 52
Blue Print Specifications 79
Architectural Hardwood Finishing, by G. Wright 109
Brayton Standards: A Pocket Companion for the Uniform Design of Reinforced Concrete, by Louis F. Brayton 100
The Estimator's Price Book and Pocket Companion, by J. P. Hicks. 100
Class Illustrations for the Sudbury of Architectural History, by B. F. Fletcher, F.R.I.B.A. 100
Building with Color 129
Blue Prints, Material Marks 132
Building on the Percentage Basis. 143, 11-x
Buildings, the Right to Photograph 9-xiv
Building Construction and Drawing, by C. Chas. [illegible]
[illegible] Coloring 11-iv
Bricklayers and Concrete Construction 161
Building for the Year 1906 178
Builders' Exchange, Toronto 12
Building on the Percentage Basis 90
[illegible] Beautifying a 105
Concrete Block 106
Concrete Building, Edison on 90
Concrete, Reinforced 153
Concrete Dam Tipped in Niagara River, The 124
Canadian Society for Preservation of Natural Beauty 1-ii
Chimney 307½ Feet High, Concrete 1-iv
Cathedral Builders 1
Cement Concrete Floor, A—British Fire Prevention Committee Test 4
Casting, Canadian rough 1-xii
C. P. R. Architect 1-xv
Concrete-Steel Construction, A New Idea in 2-xii
Concrete Blocks, Curing 2-xv, 167, 164, 12-x, 12-xii
Competitions (C. A. & B.)..36, 141, 146.
Canvas Covered Porch Floor, Preparing 44
Curly Gables 47
Clay Workers, School for 3-xii
Cement in Canada, Production of.. 3-xiv
Correspondence, W. W. LaChance, Regina, Sask. 62
Canadian Painters and Decorators 5-ix
Cement, A Talk on (First Part) 82
Correspondence, "Builder" 82
Calgary Labor Troubles 6-xv
Cement, A Talk on (Second Part) 98
Civic Improvements, The Discussion of Proposed 114
Cement, (A Talk on (Concluding Part) 115
Canadian Pavilion at Milan 130
Canada and Niagara Falls 9-x
Cement, Soda to Set 10-iv
Carpenter, The Country 10-xiv
Closets, The Abolition of 161
Canadian Clay Products Manufacturers 188, 187
Draughtsmen, Enough in San Francisco. 66
Dominion Engineering and Construction Company. 6-ix
Dry Rot, Concerning 6-x
Design for Moderate Cost House.. 189
Draughtsmanship, Successful 12-xii
Engineering Judgment 1-iii
Earthquakes and Earthquake-Proof Buildings 67
English Practice. 140
Elevator Inspection 177
Edison on Con[illegible] 177
[illegible]ces in China 106
Furnaces, Air Moisteners for 1-iii
Fireproof Test 1-iv
Furniture, Metallic 135
Floors, Resurfacing Hardwood .. 169
Good Manners of [illegible] 1-x
Granite Cutters, International Secretary. 33
Government Buildings at Ottawa, New 50
Grogs in Brickmaking 146
Gas Leak, How to Find a 188
Handicraft, The Decline of 105
Heating Fruit Cars by Ice 91
Heating at St. Thomas, Municipal 2-iii
Heating Plant, The Chatham Central. 2-iv, 4-xii
Heating and Ventilating of St. Paul's Hospital, Montreal, Que. 45
Hamilton, Building in 54
Houses, Why Some are Cold 93
Iron in Buildings, Danger of Using 166
Improvements to Toronto, The Plan of 7-ii
Illuminating Engineer, The 18
Illumination. 49
Illumination of a Residence 87
Illumination of a Warehouse 101
Illumination of Royal Alexandra Hotel, Winnipeg, Man. 119
International Correspondence School 167
Judicial Decisions 75
Labor Bureaus, German 165
Legal 166
Lighting, A New Method of Show-Window 106
Lightning Protection, Specifications for 91
Competition. 43
Lessons from San Francisco 180
Lunch Rooms, Quiet 82
Legal 113
London Fair Exhibits 8-viii
Lumber, Disappearance of 9-ix
172

INDEX—Continued

Montreal Notes, 13, 41, 60, 76, 188, 107, 121, 136, 151, 179
Moving Block of Houses 15
Mortar of Portland Cement, Retempering 44
Marble, To Clean 4-xii
Mineral Wool, Mining Asbestos or 69
Manitoba Association of Architects 82, 173, 190, 191, 192
Montreal, New Buildings in 107, 171
"Mews," Origin of the Word 10-vi
Mosquito, Extermination of the.. 155
Materials, Rigidity of Constructive 158
Marble Workers and Stone Cutters Dissatisfied, Toronto 12-x
Make Believe, The Art of 74

No Front, No Back, No Sides .. 106
Niagara Falls, Canada and 9-x
Noise in its Sanitary Aspect 161

O. A. A. 5, 165, 177
Ontario Society of Artists and Picture Making 35
Ottawa and Quebec, The Ugification of 163
Ontario Clay Products Manufacturers' Association 106

Papers from the International Congress 123
Photography, Pinhole 43
Plans in a Competition, The Awarding of 154
P. Q. A. A., 14, 15, 29, 42, 61, 77, 93, 108, 121, 135, 170, 180
Plumbing and Sanitation 20
Painter as an Educator of Original Decorations, The Master.... 2-x
"Paul's Cross" 44
Portland Cement to be Used in Concrete Blocks, Selection of.. 3-ix
Personal 3-xi, 66, 6-xv, 7-x, 12-xi
Painting, Decorative 51
Plumbers' and Steamfitters' Union, Toronto 5-xiv
Painters in Convention, Master..98, 116
Porcelain Enamelled Water Closet Tank, Advent of 111
Plumbers, Report of Convention of National Association of Master.. 125
Provincial Builders' Exchange.... 127
Photograph Buildings, Right to.. 9-xiv

Quebec City Contractors' Association 6-ix
Quebec, The Ugification of Ottawa and 163
Qualifications for Architects, The Statutory 138

Reinforced Concrete 124
Rooms of the House, About the.. 59
R. I. B. A. 71, 164
Roof Space, Utilization of 142
Reason and Tradition 147
Roof, Flat Fireproof 164
Royal Alexandra Hotel .....

Sliding Scale Unjust, The 1
Sash Cords, Knot for Tying 15
Stones in America, English Cathedral 33
Sash Weights, Over 34
Shingle Stains 42
Specifications, Value of 49
Steel Frame Building in an Earthquake 49
Steam from Earth 66
Structural Engineering 78
Smoke Abatement 82
San Francisco, Lessons from 82
Sash Balance, A Novel 89
Shingle Stains 92
Standard Sanitary Mfg. Co'y Erecting a plant in the East 25
Sandstone Deposits 6-xiv
Shaw, Mr. Norman vs. Shopkeepers 98
Strikers, Questions for 114
Stable, Design for 134
Stones, Comparative Permanence of Building 135
Soda to Set Cement 10-iv
Sewage, Experimental Disposal of 145
Spruce, Balsam and Poplar, The Use of 173
Stone Cutters Dissatisfied, Teronto Marble Workers and 12-x
San Francisco, $250,000,000 is Pledged to rebuild 105

Toronto, the Plan of Improvements to 26
Technical Training 2-xiii
Toronto Architectural Studio Club 84
Toronto Civic Investigation 98
Trade Schools 109, 177
Trade, Every Man Should Have a 130
Technical Education 130
Toronto Exhibition 131
Tunnelling, Freezing Methods of.. 140
Truth, What is 10-x
Testing Materials by Sand Blast.. 10-xi

Union Oath, The 1-xiv
Union Labor, Employment of 110

Westminster Palace 2-xii
Windmills, Power from 65
Western Canada Architectural Association 78
White, Stanford 98
Window Cleaning is Expensive.... 137
Wind Anchors 11-ix
Water Supply, Toronto 177
Western Canada Architectural Association 105
Wires, Live 58

ILLUSTRATIONS.

Architectural Studio Club, Toronto —Design by W. B. Van Egmond Apartments, Linton, Montreal—Finlay & Spence, Architects, Montreal 37 53

Bank Traders—Carrère & Hastings, New York, and F. S. Baker, F.R.I.B.A., Toronto, Associated Architects 5
Bank of Commerce—Branch on Yonge St., Toronto—Darling & Pearson, Architects, Toronto .. 17
Berlin and St. Petersburg, Views of—Illustrating Paper by Prof. P. E. Nobbs on the Official Architecture of European Capitals.. 37
Bank, Meisons—Toronto Branch—Finlay & Spence, Architects, Montreal 53
Bank of Canada, Home, Toronto—Beaumont Jarvis, Architect, Toronto 53
Bank, Dominion, Branch Corner Bathurst and Bloor Streets, Toronto—Eden Smith, Architect, Toronto 68
Bank of Toronto, Branch on Yonge Street, Toronto—E. J. Lennox, Architect, Toronto 101

Central Avenue, Rio Janiero, View of Construction of 5
Commercial Building, on the new Central Avenue, Rio Janiero 5
Cathedral Church of St. Boniface, Man.—Marchand & Haskell, Architects, Montreal 54
Cottage for Dr. Adam, at Windermere, B.C., Proposed—P. E. Nobbs, A.R.I.B.A., Architect, Montreal 133
Canadian Pacific Railway Offices, Victoria, B.C.—F. M. Rattenbury, Architect, Victoria, B.C. 133
Church, Emmanuel, Montreal, Que. —Saxe & Archibald, Architects, Montreal 149
Cast De Las Concnas, Salmanca, Spain 165
Cooksville, Ont. 17
Cathedral, Esplanade, Quebec 17
Decklands, Ingatestone, Essex, England 165

Entrance to No. 30 St. James St., Montreal 5

France and Italy, Selections from Photographs Taken in—By J. P. Hodgins, Toronto 117

Government House, Victoria, B.C. —F. N. Rattenbury, Architect, Victoria 85

House of Small Cost in a Country Town—Designs by E. H. Yeigh & W. B. Van Egmond 37
House of Small Cost in a Country Town—Design by V. G. Steer, Toronto 53
House of Small Cost in a Country Town—Design by S. Douglas Ritchie, Montreal 86
House of Small Cost in a Country Town—Design by W. L. Somerville, Toronto 101
House of J. C. Gerdon, Winnipeg, Man.—Darling, Pearson & Over, Architects, Winnipeg 117
House for C. W. Colby, Esq., Montreal, Que.—P. E. Nobbs, A.R.I.B.A., and D. R. Brown, Architects, Montreal 117
Hotel, Oak Bay, Victoria, B.C.—F. N. Rattenbury, Architect, Victoria, B.C. 133
Houses in Victoria, B.C.—F. N. Rattenbury and S. Maclure, Architects, Victoria 149
Home for Aged Women, Toronto —Langley & Langley, Architects, Toronto 165
House of Small Cost in a Country Town—Design by "1500" (Name Unknown) 165
House for Duncan Macdonald, Toronto—Messrs. Bond & Smith, Architects, Toronto 181

Library for Toronto, Public Reference—Wickson & Gregg and A. H. Chapman, Associated Architects 85

McGill Students' Union—P. E. Nobbs, M.A., and Hutchinson & Woods, Montreal, Que., conjoint Architects 181

Office Building for Federal Life Assurance Company, Hamilton, Ont.—Finlay & Spence, Architects, Montreal 58, 101
Outremont Cathedral, near Montreal—J. Z. Resther, Architect, Montreal 117

Plan of Improvements to Toronto Parsonage for the Metropolitan (Methodist) Church, Toronto—Sproatt & Rolph, Architects, and S. G. Curry, Consulting Architect, Toronto 17 68
Quebec, Sketches in Old—By J. Rexburgh Smith, Montreal 37

Rectory of the Church of Holy Trinity, Winnipeg, Man.—Darling, Pearson & Over, Architects, Winnipeg, Man. 101
Residence for Robt. Wigatman, B.A., Toronto—Gordon & Helliwell, Architects, Toronto 133

St. Petersburg, Views of Berlin and—Illustrating Paper by Prof. P. E. Nobbs on the Official Architecture of European Capitals.... 37

Venice, Scenes in; From Photographs taken by J. P. Hodgins, Toronto 133

Westminster Palace, From the Victoria Embankment—From a Photograph by J. P. Hodgins, Toronto 54

ILLUSTRATIONS IN TEXT.

Asbestos, Fiberized; Asbestos Raw 69
Asbestos Mine, King Bros., Thetford, Que. 69
Asbestos Mines of the H. W. Johns-Manville Company, Danville, Que. 70

Bank of Montreal, Toronto—Darling & Pearson, Architects, Toronto 30
Bank of Montreal, Edmonton, Alta. 153
Bank of Nova Scotia, Calgary, Alta. 154

Church at Pointe-Aux-Trembles, Que. 71
Church, Protestant, Chambly, Que. 108
Church, Ste. Genevieve, Que. 122 136

Derrick, Revolving Tower 143

Entrance of Central Methodist Church, Toronto—G. M. Miller & Company, Architects, Toronto .. 89

House at Pointe-Aux-Trembles, Que. 109
House at Chambly Canton, Que.. 122
House, Ste. Genevieve, Que. 136

Monument to Octave Cremazie, St. Louis Bridge, Montreal 121
Mill, Chambly Canton, Que. 122

Portrait of the late Mr. Chas. P. Baillairge 66
Portraits of Officers and Directors of the Montreal Builders' Exchange 57
Portrait of Mr. N. T. Oegnon, Past President Montreal Builders' Exchange 58
Portrait of Mr. Alcide Chaussée, President P.Q.A.A. 29
Portraits of Officers and Directors of the Toronto Builders' Exchange 73
Portrait of Mr. M. Tetrol, Toronto, Winner of I.C.S. Competition 180
Portraits of Officers Montreal Builders' Exchange, Montreal.. 185

Store in Phillips' Square, Montreal 76

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XIX.—No. 217. JANUARY, 1906.

ILLUSTRATIONS ON SHEETS.

The Traders Bank of Canada Building, Toronto.—Messrs. Carrère & Hastings, New York and Mr. F. S. Baker, F.R.I.B.A., Toronto, Associated Architects. View of Structural Steel Work from a Photograph—Perspective of Completed Building.
Entrance to No. 30 St. James St., Montreal.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

View of construction of new Central Avenue, Rio Janeiro.
Commercial Building on the new Central Avenue, Rio Janeiro.

CONTENTS

Editorial 1-2
Permanent Art Commissions 3
British Fire Prevention Test, A Cement Concrete Floor 4
Our Illustrations 5
Proceedings of the Ontario Association of Architects Annual Convention 6-10
Intercommunication 11-12
Montreal Notes 13
The Province of Quebec Association of Architects 14
Architectural Acoustics 14
The P.Q.A.A. Sketch Club 15
Moving a Block of Houses 15
Knot for Tying Sash Cords 15
The Billboard Malady 16
A Full Account of the Concrete Dam Tipped in the Niagara River ii
Engineering Judgment iii
Air Moisteners for Furnaces iii
Canadian Society for Preservation of Natural Beauty iii
Concrete Chimney 307½ Feet High iv
Fireproof Test ix
The Good Manners of a Good Neighborhood x
A Dream in Architecture xi
Canadian Rough Casting ..... xii-xiii
The Union Oath xiv
The C.P.R. Architect xv

CHANGE OF ADDRESS.

After the 1st of February the Vancouver office of this paper will be located in the new Davis Chambers Building on Hastings street, near the corner of Granville street, where more commodious quarters have been secured, and where our representative will be pleased to meet the friends of the paper.

The Cath dral Builders.

At last some one who writes with the authority of learning has arisen to say what many of us knew to be true though we had no standing against those who write books to the contrary. Mr. Edward S. Prior, in a book called The Cathedral Builders in England quietly snuffs out the idea that the cathedrals were the work of a guild. The idea appears to have originated or at any rate received its authority from Lord Maucaulay who, in a conversation reported by Mrs. Beecher Stowe, said: "I believe that all the cathedrals of Europe came into existence nearly contemporaneously, and were built by travelling companies of masons under the direction of a systematic organization." The chronological study of Gothic architecture was in its infancy in Macaulay's day and he probably knew less about it than our students do now—so much is the greatest mind limited by its age. The theory of the Freemason guild is interesting as showing how the mind of the historian works over the vestiges oft he past; but we also see how essential to its working are the scientific burrowings of specialists in search of mere facts. It is the suspicious absence of facts referring to the Freemason's guild that has given us, when reading about them, the uneasy feeling that ends in skimming. Mr. Prior turns suspicion to conviction. "This guild," he says, "if it existed, must also have had a supernatural power of hiding its tracks, for in all our accounts and records are no references which can be twisted into a consciousness of a Freemason guild. Instead of indicating a central body of masoncraft to which ecclesiastics applied for the building of their churches, they mention artizans coming haphazardly together, and their organization for the special work, as at Canterbury, or in the case of continuous building in one of our large cathedrals, we have the establishment of a cathedral bureau—'opus' or 'opera' as it was called—such as at York, which has indeed practically continued to our own day."

Architectural

The review of Mr. Prior's book in *The Builder*, from which we get the above extract, also quotation from Lord Macaulay, gives another extract which is a valuable contribution to the discussion as to the existence of optical refinements in the architecture of the middle ages which has been [illegible] in England by the appearance in Edinburgh of Professor Goodyear and his exhibition of photographic views of irregularities in mediæval buildings. Professor Goodyear's articles are generally known here. As they came out in the *Architectural Record* we read them, at first with excitement, then with a gradually waning interest as we saw that, though irregularity was being found everywhere, there seemed to be no system in it, and the author seemed to prove too much intention to be true. Mr. Prior says: "I have never found any system of æsthetic creation in the proportions of mediæval building beyond the simplest promptings of the square and the compass. The curvings of walls and the irregular spacings of supports can be seen to be one of two things, either the immediate habit of craftsmanship or the result of expediency—both varied by the difficulty of building piecemeal and to suit existing buildings, difficulties that were the constant necessities of churchwork in the Middle Ages."

The Sliding Scale Unjust.

Mr. Cass Gilbert, the architect of the Minnesota State Capitol, has proved by experience, as appears from a letter of his addressed to the editor of *The Western Architect*, that the sliding scale of fees

works injustice to the architect. Mr. Gilbert's first contract with the Board in charge of the building operations was for a proposed cost of $1,500,000 on a sliding scale which averaged 4 per cent. When the appropriation was increased the fee for the remainder according to the sliding scale would have been 2 per cent.; but, as he had already sufficiently proved that the expenses of his office were considerably in excess of this he protested, or more properly speaking resumed a protest that he had made from the first, against the dimunition of the scale of fee to 2 per cent. He argues that "if the first portion of the work is worth 5 per cent., the last portion, which is always the most elaborate, cannot be performed for 2 per cent." The Board saw the essential fairness of his position and wrote a new contract with him, extending the old contract upon the basis of 5 per cent. for all work above the $1,500,000. The Board's action was made the subject of investigation by a committee of the House of Representatives and was sustained by the House. Mr. Gilbert says that much of the 5 per cent. work was done at a loss, even at that figure. His opinion is that "no matter how large the work may be, if it is at all enriched in detail and finish, 5 per cent. is a small compensation, although it may look large in bulk when taken by itself," without considering the work done. He suggests that we should "compare it with the compensation paid to real estate men for the buying and selling of land" and "compare the amount of the work in each case." Mr. Gilbert's letter was written originally not for publication but to correct an understatement of the amount of his fee that appeared in *The Western Architect*, and to suggest to the editor that he should advocate a 5 per cent. minimum, so as to prevent other Boards from making the mistake of attempting to employ architects on the sliding scale basis. The action of the Minnesota Capitol Board and its support by the Legislative Investigation Committee, are strong evidence against the reasonableness of the sliding scale system.

Signing Architecture.

Whatever may be the case in the old world, which gives a [illegible] tinent, the architect is the leading figure. The names of prominent architects are well known, not in their own city only but throughout their own country and beyond it. It is questionable whether any architect in the history of the world has ever been so widely known, in his own generation, to a general public, as is, at the present moment, Mr. Daniel H. Burnham. This is partly due to the widening of the architects' sphere, and in Mr. Burnham's case, to a celebrity gained by his successful conduct of the building operations of the Chicago Exhibition, continued by his connection with the Washington improvements project, and by the frequency with which he is applied to now for advice by cities that are devising improvements in their plan. But while these large dealings naturally attract attention, so that the newspapers mention Mr. Burnham's name with the same simplicity as they would a general's, in full confidence that every one will know who he is, there are architects who are not architects of cities, but only of buildings, who are almost, if not quite, equally well known. Building is in fact going large now-a-days; a single structure may be an important addition to any city, and this importance naturally gives the architect a new interest for the public. The interest spreads to the smaller designers, partly as members of the same profession but partly for another reason—the new importance that is attached by the mass of the people to their houses, since it has become as easy to own as to rent. Indeed in some places in Canada it is more easy to own than to rent; for speculative builders build only to sell and will not rent. This state of affairs has brought about a widely spread domestic sentiment which is acting as a wholesome counteragent to the idea that life in a flat, without housekeeping or other responsibilities, is the American woman's due. The use in the United States of the pregnant word "home" instead of the simple word "house", irritating as it is when used on all occasions, marks how this sentiment has grown and how, (which is our present object in noting it), the interest taken in small houses has become attached to their architects.

Even the press is not without signs of abandoning its tradition of ignoring the architect in its notice of buildings. The editors of the daily papers are still as sensitive to a "free ad." as they are to a typographical error, yet the names of the architects of projected buildings are always mentioned under the cuts of the buildings which are so frequently inserted now in the newspapers.

This growing interest in architects is a mark of awakening recognition that architecture is an art. This—it being the truth—it is a good thing to have recognized. It is to the advantage of everybody that the recognition should be furthered in every possible way; and one way which has been frequently proposed, is that architects should sign their buildings. In speaking of it recently, in a presidential address to the Architectural Association, Mr. Guy Dawber said that the signature of buildings is a custom on the Continent. That it is not unknown in England may be seen on the terra-cotta face of an hotel building in [illegible], where the signature of Messrs. Ernest George and Peto, architects, appears as a conspicuous corner decoration. When one sees a signature placed [illegible] aware that it does not make for benefit to the architect unless he has done well. The proceeding clearly has a double side—both working for good: that the art of architecture should be exalted in the eyes of the public and that the architect's sense of responsibility should be kept alert. When an architect did his work under a cloud of oblivion; paired off with the plumber in building operations, as equally undesirable and only not so necessary; it required stout and enduring character and conscience not sometimes to sink into a state of indifference and compromise. It is hard to uphold the fine thing against its neglect. It is hard to uphold an art alone. Indeed—as art that is alive always gets its living quality by expressing the life of its time, and only pedantry or eccentricity comes from the secluded artist—the more the architect is in touch with the world the better for his art.

The growing interest in architecture and architects is wholesome, and if it is assisted by a movement towards signing buildings it will be a good thing. It is quite likely that no formal assistance will be needed to such a movement, but that a custom so much in accordance with the general feeling of this time of Renaissance will arise, as customs do arise, all at once, everybody apparently following everybody else.

PERMANENT ART COMMISSIONS.

It will be observed that the address of the President of the Royal Institute of British Architects, part of which was reprinted in our last issue entered very seriously, and at greater length than in any other part of his remarks, into the question of the improvement of London. The President of the Society of Architects, whose address is reported in the English architectural journals, placed equal weight upon this question. The last meetings of the Architectural League of America and of the American Institute of Architects had papers upon the subject; and the policy of planning improvements to Washington was the theme of Mr. Roosevelt's remarks at the Institute dinner. The annual meeting of the Ontario Association of Architects last year had, in the same manner, two important papers upon the subject of city improving, and a committee formed by that body has since made a plan for The Toronto Guild of Civic Art which will now become the property of the Guild and it is hoped will before long be the property and working plan of the city of Toronto. There is nothing solitary about this effort. However original may have been the impulse that led to it, the effort is only part of a general movement on this continent. We have heard a great deal of the Cleveland Architectural Club's work in accomplishing the celebrated "group plan"; and, under whatever influence, other cities are deep in the same work—Buffalo, St. Louis, Philadelphia, Baltimore, New Orleans, St. Paul, Minneapolis and Chicago, not to speak of Boston and New York which have got past the stage of spasmodic effort and entered to some extent upon the sort of methodical process which it is the purpose of this article to advocate.

It there is one thing of which we can speak confidently as a contribution of our own century to the history of art, it is this—the popular desire to beautify cities. Earlier generations built beautiful buildings or groups of buildings, and made spaces for beauty here and there. Nobles and kings had wealth and power that enabled them to make beauty [illegible] city, but the city itself was not the object of their effort. Now it is different. As the individual lessens and the [illegible] whole, we are not satisfied with perfection in buildings here and there and squalor between, but want the whole town to be as much as possible a pleasant place to live in.

This first took the form of sanitation, to which we are now so accustomed that we hardly realize it to have been the work of the last century.

We read of London gentlemen, in the time of the Stuarts and later, being dressed in silk and velvet trimmed with lace, and we look at our own sober tweeds and think the world is not what it was. That is true but in another way. The gentlemen in silk and lace walked close to the walls of the houses as they passed along the street, for fear of being splashed, by a passing horseman, with the liquid mud of the roadway. We are practically unacquainted with mud. We have a little dust and grumble much about it; but our grumbling cannot compare with that of Charles II, who declined to drive to the city because the wheels of his coach stirred up such a stench from the roadway. If this was the condition of main avenues, the site of palaces and great churches, what must have been the state of by-ways and alleys where, as Macaulay has said, "men died as fast then in the towns of England as they do now on the coast of Guinea."

All this—after centuries of indifference to it, founded on ignorance—disappeared under the influence of advancing science; and London's 300 miles of streets have, by the force of one impulse, been all drained, paved, and piped for gas and water.

Our generation has been born to this state of affairs and expects nothing less; but, just like our forefathers before the days of sanitation, we have expected nothing more. That anything at all resembling the immense sums that have been spent in making cities comfortable to live in should be spent in making them beautiful startles us. Events however are familiarizing us with the idea. It is not so strange to the public mind as it was a few years ago. But it has not yet become part of the matter of municipal politics. There must have been something of the same halting start in the beginnings of sanitation. But, though the expense of draining a whole city or laying on water to every house must have at first appalled, the conviction of its necessity soon found a method for its accomplishment.

It is method we want in the matter of beautifying cities. Conviction is gaining strength continually but we have no method. It seems to have been generally supposed that this was a matter for individual effort; that those who like beauty should promote its attainment and procure the means for it. That did very well to start with; when the state of the public mind in regard to the matter was not known; but the state of the public mind is quite clear now. There are not only a number of societies in the cities formed to promote "civic art"—we have a name for it now—but bodies formed for other purposes [illegible] delegates to the civic art societies and pass resolutions at their own business meetings in support of projects for beautifying their town. The public in general is thoroughly aroused upon the subject, and all those who stand in the place of guides and guardians for the public [illegible]

Then, if we all want to have our cities add to their [illegible] method. For the mere want of method the present generation may go on all its life, wanting and not having; while satisfaction—not all at once perhaps but continually increasing—is within its reach for the expenditure of a moderate sum per annum.

The amount per annum to be spent may in time perhaps be settled as bearing some fixed relation to the rate of taxation for general purposes, but at first it will be easier to settle upon a round sum.

This has been done for the city of Ottawa by the Dominion Government, and the progress that is made in the beautification of the capital by means of a yearly grant may be taken as an object lesson for the other cities of the Dominion. For Ottawa $60,000 per annum was considered a proper amount. Therefore in proposing a sum of $50,000 per annum for cities like Montreal or Toronto—or Winnipeg, which is growing rapidly and would do well to grow wisely—we are proposing what may be truly called a moderate sum.

Yet how much could be done with the certainty of such a sum being available every year. It means a quarter of a million in five years. With that behind

them its administrators could borrow and go on with some considerable work. It would not be necessarily all expenditure. Some improvements make returns; and, under good management, the power to use a considerable sum would sometimes produce results commensurate, from a financial standpoint only, with the expenditure involved.

Such management would have to be independent of the municipal election system. It should be a permanent commission, perpetuated by appointment; able to carry out a continuous policy and acquire skill from experience. Under these circumstances we could find men of standing who would be willing to serve as commissioners, for the work would be worth doing.

BRITISH FIRE PREVENTION COMMITTEE TEST, A CEMENT CONCRETE FLOOR.

This test was made to enable some decision to be made as to the peculiarities in behavior and the comparative reliability of aggregates for concrete floors intended to be fire-resisting.

A brick testing hut was built, measuring 10 ft. 2 in. by 53 ft. 4 in. internally. This was covered in at a height of 8 ft. 3 in. above the pavement of the hut with the floor construction which was to be tested.

The floor was divided into seven bays by six steel I beams, measuring 6 in. by 4½ in. and weighing 20 lb. per foot. The ends of the beams were built into the side walls of the hut, 1 in. clear space being left at the ends of each joist. Each joist was encased with coke breeze concrete, 9 in. wide by 10¾ in. deep, so as to give a minimum of 2 in. of concrete all round the joist.

The seven bays thus made each measuring 10 ft. 2 in. long by 2 ft. 7 in. wide between the concrete casing of the beams were filled in by slabs of concrete [illegible] in. which were quite separate, resting on a 4½ in. set off all round the walls of the hut and on the concrete casing to the girders. The slabs were not fixed on the girders; and their edges were free all round from contact with the walls and each other, by a space equal to the [illegible] slab which [illegible] before being made.

The different concretes were made in the same manner, the material was tipped both in its dry and wet condition, and the [illegible] on the centering in a rather wet state. 1. 2 gallons of water were used for each cubic foot of concrete, approximately 20 per cent. of water by volume.

The cement used was the same for each slab, viz. Portland; a London make called "Ferrocrete"; ground very fine so that there was only a 14 per cent. residue on a sieve with 32,400 meshes to the square inch; of great tensile strength, and expansion not exceeding 2 m.m. under the Chatelier test.

The sand when it was used was also the same for each case viz. clean pit sand.

The aggregates used and proportions of material for the seven bays were as follows:—

		Parts by volume.
I Slag Concrete	Blast furnace slag	3
	Sand	2
	Cement	1
II Broken Brick Concrete	Broken brick	3
	Sand	2
	Cement	1
III Granite Concrete	Broken granite	3
	Sand	2
	Cement	1
IV Burnt Ballast Concrete	Burnt ballast	5
	Cement	1
V Coke Breeze Concrete	Coke breeze	5
	Cement	1
VI Clinker Concrete	Furnace clinkers	3
	Sand	2
	Cement	1
VII Thames Ballast Concrete	Thames Ballast	3
	Sand	2
	Cement	1

When the work was completed the hut was covered with tarpaulins. The centering was removed 14 days after the slabs were formed. After five days, the coke breeze casing to the beams was rendered with plaster, ¼ in. thick. After 9 days, each separate bay was loaded with bricks equal to a distributed load of 224 lb. per ft. super. A month after completion a coke burner was kept alight in the testing chamber for seven days. On the following day the covering was removed from the roof and the test was made.

The test consisted of the application of heat by means of gas for a period of three hours, reaching 900° Fahr. in the first 5 minutes and continuing to rise during the rest of the time until, about the close of the test, a temperature of 1920° was reached at the hottest spot.

After the first ten minutes the plastering began to fall off the beams, and continued to fall in patches throughout the test, but nothing noticeable occurred to the beams. When, at the close of the test, water was applied for three minutes, more plaster was washed off the beams but nothing further could be observed.

During the test it was seen from above that the edges of slabs Nos. I, VI and VII, where they could be seen in the space between their ends and the wall, were red hot.

On the next day the bricks forming the load were removed. Observations of the under side were made on that day and of the top two days later. The observations were as follows:—

Bay No. I. Slag Concrete.

Soffit. Practically flat. Sl[illegible] due to those on top.

Top. Cracked across into about three equal parts, [illegible]

Bay No. II. B[illegible]

Soffit. Curved downwards ¼ in. Slight cracks corresponding to those on top.

Top. Cracked across into four unequal parts. Very slight curve downwards.

Bay No. III. Granite Concrete.

Soffit. Curved downwards ½ in. About 1 in. washed off the surface in one part and the surface slightly washed off over the area struck by the water.

Top. Slab cracked across into four parts; curved downwards about ½ in.

Bay No. IV. Burnt Ballast Concrete.

Soffit. Roughly curved downwards about ¼ in. About 3 in. in depth washed off the surface in one part,

Top. No cracks—not curved.

Bay No. V. Coke Breeze Concrete.

Soffit. Flat. About 1 in. washed off the surface all over where struck by the water.

Top. No cracks—not curved.

Bay No. VI. Clinker Concrete.

Soffit. Flat. Surface pitted in places about 1 in. deep where struck by water, and in one place 2 in. deep. One slight crack visible.

Top. Cracked across into about three equal parts. Curved downwards about ⅜ in.

Bay. No. VII. Thames Ballast Concrete.

Soffit. Curved downwards 1½ in. Several bad cracks longitudinally, extending over almost the whole area in various irregular directions. Surface damaged all over to a greatest depth of about 2"; a hole in one corner through which daylight was seen.

Top. Cracked in very many places generally transverse, but in various diagonal directions as well. No actual longitudinal cracks on this side. Curved downwards about 2 in.

Beams. Portions of the plaster remained on all the beams, but badly cracked and flaked. Each beam had part of the concrete washed off where struck by water. No steel work exposed. The concrete disintegrated about 2 in. in depth on the soffit in patches.

OUR ILLUSTRATIONS.

THE TRADERS BANK OF CANADA BUILDING. MESSRS. CARRERE AND HASTINGS, NEW YORK, AND MR. F. S. BAKER, F.R.I.B.A., TORONTO, ASSOCIATED ARCHITECTS.

Our illustration of the structural steel-work is from the last photograph taken of the work. Since then the pitched beams of the roof have been for the most part erected and the frame is almost complete. We take the opportunity of repeating the perspective view, which was published in our November number but, by an unfortunate mistake, without the names of the associated architects.

ENTRANCE TO NO. 30 ST. JAMES STREET, MONTREAL.

VIEWS OF NEW CENTRAL AVENUE, RIO JANEIRO.

These illustrations in the Architects' Edition show the construction of a wide avenue cut through the centre of Rio Janeiro by a commission which purchased a strip of land wide enough to include not only the avenue itself but the building sites on each side of it, and by the sale of these sites more than recovered the cost of the purchase of the property and the construction of the roadway. The [illegible] of the illustrations is to the allusion to the transaction in the speech made by Mr. Frederick Nicholls at the dinner of the Ontario Association of Architects, the report of which we are obliged to hold over until our next issue.

ONTARIO ASSOCIATION OF ARCHITECTS ANNUAL CONVENTION.

The Association met for its 18th Annual Meeting in the Association rooms, 96 King Street West, Toronto, at 2.30 in the afternoon of January 16th.

The following members were present:

Messrs. Burke, Baker, Toronto; Belcher, Peterborough; Bishop, Boultbee, Denison, Gemmell, Gouinlock, Gordon, Gray, W. R. Gregg, A. H. Gregg, Helliwell, Toronto; Kay, Paris; Kennedy, Barrie; Langton, Law, McKenzie, Menges, H. E. Moore, Toronto; Munro, Hamilton; Nicholson, St. Catharines; Ogilvie, Ottawa; Pearson, Toronto; Power, Kingston; Smith, Stephenson, Sparling, Symons, Toronto; Thomson, Sault Ste Marie; Wickson, Woolnough and Wright, Toronto.

The minutes of the last Annual Meeting were read and adopted.

The President, Mr. Edmund Burke, read the following address:

PRESIDENT'S ADDRESS.

The President of the Ontario Association of Architects welcomes you to this its 18th Annual Meeting and congratulates you on the completion of another year of prosperity throughout the whole country in all phases of business, and especially in the extent and importance of the building operations which are so vital to the prosperity of our profession.

THE CITY PLAN.

A year ago the Association in convention decided to forward the project of a comprehensive plan for the improvement of the City of Toronto. A committee was appointed with power to add to its number, and members of the Guild of Civic Art, the Toronto Architectural Eighteen Club and the Engineer's Club were invited to co-operate. The Guild of Civic Art kindly financed the scheme securing subscriptions from the citizens to defray the cost of an expert draughtsman, and the necessary printing and other expenses. Weekly meetings for discussion of the various projects were held during the Spring, Summer and Autumn. The result will be presented to you at to-morrow's meeting.

It remains now for the membership of the Association to assist by all possible means the launching of the project. Doubtless a long campaign of education of the public and the City authorities will have to be entered into, as large expenditures will be involved and some radical changes suggested. The plan has in view the future development of the City on comprehensive and right lines. Emphasis will need to be laid, however, on the fact that the cost can be distributed over very many years, that the changes need be but gradual, and that present expenditures can be confined to securing such properties as are necessary to this comprehensive development, and which if lost now to the City, may be forever lost.

It is suggested that the scheme, when adopted, can be best handled by a carefully selected Commission whose tenure of office shall be such as to permit of a consistent and continuous policy.

THE COMBINES.

An event which has created widespread interest and comment in the Province and particularly in Toronto has been the exposure of the combines, including those of the plumbers, plumbers supply men, and plumbers trades unions, which have caused such an undue advance in the cost of building.

Architects have been confronted for several years with this serious state of affairs, and the matter was frequently referred to in the meetings of the Toronto Chapter, but no one seemed prepared to offer a solution of the problem of how to obtain a healthy competition in tenders, and the consequent reduction of cost to a reasonable basis.

It is a source of satisfaction to have discovered, through the action of the officers of the law, that such doings are illegal and the perpetrators liable to prosecution. The building public may now take courage in opposing combines of this character instead of feeling hopelessly under their power.

It may be taken for granted that secret actions or combinations which result in undue enhancement of prices are probably illegal, also that the fact of secrecy suggests the possibility of injustice, which again suggests the possibility of secret and illicit combi[illegible]

ly submitting to such combinations, and that if again confronted with a like situation our clients should be at once advised to seek the advice of their solicitors.

THE TARIFF ON PLANS.

Advantage was taken of the presence of the Tariff Commission in Toronto last November to present a long standing grievance of the profession, the admission, practically free of duty, of plans by foreign architects, for Canadian buildings.

As administered by the Customs department, the duty on plans has, for years, been merely nominal, being based on the cost of blue prints, as such, without any reference to the value of the services performed in the preparation of the designs or even the cost of draughting the original drawings.

The Government has thus lost many thousands of dollars of revenue during the past few years.

If we had reciprocity in architecture the matter would not be of such serious consequence, but when our plans are not permitted to enter the United States without paying a heavy duty and when our architects are not allowed to practice on the other side of the line, it certainly becomes the duty of our Government to afford us the same protection which it affords to practically every other business or profession in the country.

Your representatives were very courteously received by the Commission and given a patient hearing.

Surprise was expressed by members of the Commission at the state of affairs, and they stated that while the law as passed some years ago had not been changed, the rulings may have been altered resulting in the above anomaly.

The tariff on plans, according to the Statutes, is placed at 2% on the cost of the building erected. On a $100,000.00 building this would amount to $2,000. As lately administered a full set of blue prints could be brought in for probably $10.00 or about 20c. per sheet, if not clandestinely introduced without any payment whatever.

The commissioners requested an expression of our views in writing with a suggested reasonable tariff. The following is a condensation of what was prepared and forwarded:—

SUGGESTED SCHEDULE OF DUTY ON PLANS.

1% on the cost of the building, or instead of the above, a rating

of 40% on the amount of the architect's fee which should be put at 2½% on the cost of the building, for plans and specifications.

For detailed drawings the architect's fee should be put at 1% on the cost of the building and the duty 40% of that amount.

THE TORONTO ARCHITECTURAL EIGHTEEN CLUB.

Your instructions, a year ago, empowering a committee to arrange terms for the admission and amalgamation of the Toronto Architectural Eighteen Club resulted in several conferences with a committee of that organization, which, however, have so far been barren of satisfactory results.

The draft terms involving certain changes in the Act, which were approved by the Convention, were submitted to our solicitor for the purpose of having such changes drawn up in legal and parliamentary form. He strongly advised against any radical alteration of the Act and suggested simply the transfer of the educational clauses from the Act to the by-laws passed by the Council, where they could be dealt with and modified from time to time.

The Committee of the Eighteen Club approved of this change but failed to secure its ratification by the Club, which demanded more radical changes than your committee were empowered to concede. It remains for the Convention to say whether further negotiations shall be entered into.

SKY-SCRAPERS.

The City of Toronto has finally been invaded by its first real "sky-scraper."

In view of the narrowness of the streets of Toronto, especially in the business section, the arrival of the tall building must be looked upon as an unfortunate circumstance and a precedent for further erections of similar buildings.

The introduction of a by-law limiting the height of buildings cannot be advocated too soon.

THE TORONTO FREE PUBLIC LIBRARY COMPETITION.

The most important competition in several years, that of the Toronto Library, is now under way. The terms were submitted to the Toronto Chapter for criticism on the eve of their publication. Modifications of several points were asked for and some minor ones conceded.

The Board refused to accept the suggestion that three architects should be entrusted with the selection of the prize designs instead of the selection being confided to that body, which consists of the Mayor, a member of the City Council, a member of the Library Board, the Chief Librarian and the City Architect, with a sixth judge, an architect, who is to be elected by the Board.

The Board raised the limit of cost from $250,000 to $260,000, a paltry addition, in response to our protest that the first mentioned amount was entirely inadequate, and that a building of the required size and description would cost nearer $350,000 than the amount named.

A majority of the architects are holding aloof from the competition feeling sure that the result will be unsatisfactory, while several of the younger men are indulging in a little practice in design, with an undercurrent of hope that by some fortuuate turn of the wheel one of them may be selected as the "martyr" who shall be called upon to have the prize dangled before his eyes while he toils at the working plans and specifications in a vain attempt to squeeze a $350,000 building into a $260,000 [illegible] which shall be no mean monument to his genius and powers of design.

A prediction may be ventured that the second and third prize men will be the only ones who will [illegible]

The new General Hospital, now in the preliminary stages, promises to prove one of the most important building operations in the city of Toronto.

Its construction on right lines will depend largely on the saneness and breadth of view of the managers of the institution.

The very best architectural advice should be secured and if it shall be decided to throw the work open to competition, no limit of country or place should be imposed.

In any event the architect who is finally entrusted with the work will require to spend months of study of the best models extant, both in the old world and the new.

The opportunity is one of a lifetime and a man or men strong in planning and construction and with large executive ability will be needed to bring the work to a satisfactory conclusion.

GETTING WORK AND ARCHITECTURAL ETHICS.

Judging by the expressed statements of some architects and the actions of others there seems to be a tendency to depart from the good old time-honored professional method of waiting for the work to come to the architect.

It appears to be the rule in most businesses in this bustling age that if one desires business he must go out and hustle for it; and in the professions there is a tendency toward more or less advertising in veiled forms, or exploiting oneself more or less openly.

The question arises, where shall the line be drawn. Shall a young and unknown man sit in his office waiting, sometimes vainly, for clients; shall his friends exploit him, or shall he go and offer his services whenever he may hear of a new building project, or shall he depend on occasional competitions, (with abominable terms), for an introduction to prospective clients? And if such things may be winked at in the case of a young and struggling architect, at what stage of his career shall he drop these methods for the more honorable and self respecting conduct of his affairs?

If he begins in this fashion is he not likely to be so tied up to these habits that he will continue without change to the end of the chapter?

A brother architect in this city who has a tender conscience in such matters argues thus:

"If Mr. Smith has decided to build a house and starts out for the office of a certain architect to give him the commission and I, hearing that the said Mr. Smith is about to build, meet him before he reaches his destination and offer my services and secure the work, I am taking the bread out of the mouth of my brother architect, even though I am all unconscious that my client was on his way to engage another architect at the time."

But perhaps you will claim that this is too ethical, too ideal. Some one has said "Ethics is the science of ideal humanity". And should we not strenuously pursue that science? The true architect steadily aims at the ideal in his creations, and if he be true to himself he will as steadily aim at that "science of ideal humanity" which is summed up in the Golden Rule.

In regard to the architect's relations with his client it will doubtless be acknowledged by all that they are sure to be more satisfactory and that he will yield one more appreciation and respect if he comes unsolicited instead of the architect going to him to beg his work.

A motion will be introduced to-day with regard to the oft mooted question of having the Annual Meeting in other cities in rotation.

It must be admitted that a change in our policy in this respect deserves very serious consideration. The first deviation from our custom would have to be looked upon largely as an experiment, an experiment moreover which might or might not prove to be in the interests of the Association as a whole, while gratifying our members in the city which should be selected. The success of the experiment would depend in a good degree upon our hosts as well as upon the Toronto membership who would have to be prepared to spare both time and means.

It may be claimed with considerable certainty that the past year has been one of the most active in the history of the Association, perhaps exceeding those years when we engaged in an active canvas of the Legislature for further corporate powers, and the thanks of the Association are certainly due those of our members who have attended scores of meetings in connection with the City Plan.

EDUCATIONAL WORK.

Progress has been exhibited in our educational work. Some 18 students are now registered in the mathematical classes, and more students have presented themselves for the examinations than for several years past.

Classes in design, managed by the students and supervised by architects acting as patrons, are also well attended.

Personally I have to thank you for the honor you laid upon me a year ago in electing me to a seat in the Council, and my thanks are also due to the Council who elected me to the Presidency during my first year of office.

The Registrar, Mr. W. R. Gregg, read his report as follows:

REGISTRAR'S REPORT FOR 1905.

MEMBERSHIP.—The Association has a Membership of 70, of which 2 are Honorary Members, 38 regular members in Toronto, and 30 members in other places.

[illegible] Honorary Member in 1896, died in April.

Two Charter Members have withdrawn, both having retired from active work in their profession—Messrs James Adams, and S. G. Dolsons.

COUNCIL.—The Council has met ten times, with an average attendance of between 5 and 6.

STUDENTS.—Examinations were held in April, and Supplemental examinations in October. Three students passed the first examination, and two are allowed a Supplemental in one subject. Three students passed the second examination, and one is allowed a Supplemental in one subject. Four students passed the final examination, and are now members of the Association: These are Messrs. W. F. Sparling, A. E. Nicholson, Edwin Menges and J. A. MacKenzie.

GUILD PRIZE.—The Council has not awarded a prize from the Guild Fund, although the Board of Examiners reported a high standard of excellence in the students, who passed the final examination. The fund has yielded in interest about $42.

PROCEEDINGS.—The fifth volume of Proceedings was published in May; 1500 copies being printed. A larger distribution has been made than in any former year, and exchanges are received from many Societies.

TARIFF.—A new Tariff of charges for professional services has been prepared and sent to members. Copies will be sent by the Registrar, whenever requested, to those requiring new supplies.

R.I.B.A.—An alliance of this Association with the Royal Institute of British Architects has been suggested, and the Council has referred the subject to the present meeting for discussion.

EIGHTEEN CLUB.—On account of a difference of opinion with regard to the manner in which the Ontario Architects Act should be amended, the Council is unable to report an amalgamation with the Eighteen Club.

The Registrar read the concluding letter of the correspondence with the Eighteen Club.

The report of the Registrar was then adopted.

In the absence of the Treasurer, Mr. Henry Simpson, the report of the Treasurer was read by Mr. Gray, who said: "The report has been audited so far as we have been able to go. We have looked over the books and find the statement tally with the Treasurer's books. There is a little account in connection with the bank that we have not got cleared up yet. A very small matter which I have no doubt will be explained when Mr. Simpson comes home."

The report was then received and adopted.

TREASURER'S REPORT.

ONTARIO ASSOCIATION OF ARCHITECTS, JANUARY 1906.

EXPENDITURES.

Printing	$418.02	
Banquet	98.50	
Convention	220.10	
Engineers Club	36.32	
Gas	6.00	
Registrar	200.00	
Rent	93.75	
W. R. Gregg's petty cash	25.00	
Educational expenses	172.03	
Advertising agents	276.50	
Council meeting, re Mr. Belcher	10.00	
Examinations	114.47	
Insurance B.	7.20	
Bank	.75	
Membership American Civic Association	2.00	
Part pay, for cupboard	3.50	
		$1,684.14
Balance on hand		324.55
		$2,008.69

RECEIPTS.

Admission and registration fees	$ 46.00	
Members fees	258.00	
Examination fees	152.00	
Filing articles	6.00	
Advertisements	931.00	
Sale of banquet tickets	46.00	
Refund, J. Queen	5.00	
Chadwick's account	8.00	
Eighteen Club, half expenses	41.86	
Difference in gas account	1	
Interest on bank balance, 1905	9.90	
		$1,503.83
Balance from 1904		504.86

Mr. Herbert E. Moore read the report of the Toronto Chapter, as follows:

REPORT OF THE TORONTO [illegible]

The officers of the Toronto Chapter beg to present their report to the Association of Architects in Convention assembled:

GENTLEMEN:—At the annual meeting of the Chapter held last April the following officers were re-elected:—Chairman, Mr. Edmund Burke; secretary, Mr. Herbert E. Moore; treasurer, Mr. Alfred H. Gregg.

During the past year 35 meetings were held, the average attendance being 10.42 and a total of 365 which is an increase over the previous year.

The work of the Chapter during the year has been varied and instructive and it is satisfactory to note the increased interest of the members. It has become apparent what a factor the Chapter is in promoting and safe-guarding the interests of the profession in Toronto.

The principal matters discussed during the year are as follows:

1. Affiliation with the Municipal League.

2. Revision of the Architects Tariff of Fees. The old Tariff was thought unsuitable under present conditions, and the whole of the clauses were revised and submitted to the council of the Association for approval.

3. Affiliation of the Association and Eighteen Club. The situation remains practically the same as last year. Negotiations have come to a standstill pending further instructions from the Convention.

4. Tariff Revision of duty on plans prepared in the United States and brought into Canada.

This important subject was discussed on several occasions by the Chapter. The present law was found to be very loosely interpreted and the application unfair to the profession in Canada. A committee, consisting of members of the Chapter and the profession, interviewed the Government Commission which sat here during November and placed before them the disadvantage and injustice of the tariff in its present form. The Commission went into the matter thoroughly, and promised an early and earnest consideration.

5. Modifications and Revision of the City building and plumbing by-laws.

In connection with this matter a Committee appointed by the Chapter awaited on the Board of Control and pointed out the advisability of altering and striking out certain clauses in the recently revised building by-laws, that were found in practice to be either impracticable or unnecessary. As a result the Chapter was invited by the Board of Control to send in a list of proposed changes and modifications. This list was subsquently made and is now in the hands of the Board.

6. Public Library Competition.

The terms of competition as prepared by the authorities were fully discussed in order that intending competitors might have a thorough understanding of same. The general concensus of opinion was that the appropriation is entirely insufficient and that competitors run much risk of wasting their time if the terms of the competition are strictly adhered to.

7. Proposed new Hospital.

The Chapter forwarded a communication to the Hospital Board suggesting competition as the best method of securing proper plans for a building of its character, and later when it was reported that a certain firm of architects had been recommended, the previous communication was supplemented by a statement to the effect that the Chapter would beg to recede from its original position if any definite appointment had been made or recommended.

8. City Plan.

Members of the Chapter on the Committee appointed and others who were consulted from time to time have given their support in the preparation of the City Plan; in fact the present scheme is the result of much discussion during the past few years at Chapter meetings. As this matter will be fully discussed during the Convention it will scarcely be necessary to go into details.

In addition to the subjects above mentioned, various other matters have been discussed at the meetings which were of interest to the profession generally. It is hoped that the year 1906 will prove as successful as the year just closed and that the result will be encouraging not alone to the members of the profession but to the general public. This can only be accomplished by united action on the part of the members.

The report was received and adopted.

Mr. J. Gemmell read the report of the Library and Rooms Committee, as follows:

REPORT OF LIBRARY AND ROOMS COMMITTEE.

The Library Committee crave indulgence of this convention for not having found time to take stock of the books for the purpose of reporting any missing or overdue books but promise to report to council and post same on bulletin board.

As was intimated at last convention the rent of rooms has been increased to $450, $150 more than last year, $225 being our share of rent per annum. The engineers have decided to have telephone put in and ask us to share in this expense, and trust that we will do so, as in the matter of lighting our night classes make this service disproportionate.

The first volumes of Canadian Architect have been bound and added to library making the records of the association complete except the year 1890.

We have to [illegible] from [illegible] Your obedient servants,

J. WILSON GRAY,
JOHN GEMMELL.

The Registrar: I would like to call attention to that clause about the volume for 1890. If we had that one volume it would fill the gap between the time that our Conventions were fully reported in the CANADIAN ARCHITECT AND BUILDER, and the time we began to publish them ourselves. We should be glad if any member can show us the way to procure that volume and bind it with the others.

It was moved by Mr. Gemmell, seconded by Mr. Gray that the report of the Library Committee be adopted. Carried.

PAPER ON FIREPROOF CONSTRUCTION.

BY MR OWEN BRAINARD, C.E., OF NEW YORK.

Mr. Brainard spoke as follows:—

"Allow me, first of all, to express to you my appreciation of the honor and privilege of addressing you to day and I deem it a peculiarly happy circumstance that in the discussion of technical topics and in the furtherance of better standards of work we are not called upon to consider any boundary lines and a man from the States may be called upon to address a Canadian body just as an architect or engineer from Canada would be welcomed by an audience in the States.

The subject of the fireproofing of buildings might seem to be a trite one but its triteness is more apparent than real. There has been for the last ten years, and, indeed for many years before that, much discussion of fire-proofing methods but this discussion has all made for progress and by reason of this agitation and the constantly accumulating weight of experience, obtained to be sure at great cost by expensive conflagrations, a gradual evolution in fire-proofing methods has been brought about, until, as we look back, we see that there has been constant progress and development, and that this subject is a trite one only to those who conclude that we have come to the end of

our knowledge and that there will be no further developing or perfecting of fireproofing methods.

Even the most brief attention to the recent great fires will convince anyone that we have yet much to learn, and that the problem of protecting life and property in buildings from fire is far from its perfect solution. It is extremely probable that we shall for many years be engaged in the study of it and that we shall not attain to any degree of security without very great effort long sustained.

I have been engaged for the last twelve years in the design and construction of so-called fire-proof buildings, and I have endeavored to use the best methods available, constantly seeking for improvements and yet I deem myself but a learner and student in this field.

The architect and the engineer, engaged as they are in the expenditure of their clients' money, have many responsibilities which should rest heavily upon their conscience; and I consider the question of fireproofing one which should be met with the greatest degree of conscientiousness. I recall the comment of an exasperated owner who contemplated the ruins of a fine building and who was told that his architect had not perhaps paid very much attention to fireproofing. He made this pithy comment, which I repeat without, I hope, provoking a theological discussion: "He paid so little attention to fireproofing in this world that he will undoubtedly have much time and occasion to think about it in the next."

You are operating in Toronto under a very admirable code, instituted, as I suppose, soon after the great fire of 1904, and it has many excellent provisions, better in many respects than some codes which were formulated expressly to provide for high grade fireproofing,—as the Chicago code or the New York code—and in anything that I may suggest to you to-day I shall not have it in mind to criticise this code, bnt only to impress upon you the necessity of constant revision. The development of building material and the new uses of old material progress and change so rapidly that a code which would fairly meet the conditions of three years ago would to-day stand in need of considerable revision, and, as I believe that the architects in any community should feel that they are responsible for the excellence of building methods and for the quality of work produced, so you should consider that the responsibility of keeping your codes modernized and up to the standard of the best practice rests upon you.

A consideration of the subject of fireproofing naturally brings one to the question of high building practice, for the reason that the fireproofing problems in a high building, that is a building with a steel frame, are naturally more complicated and difficult than in the case of a building of moderate height with masonry walls and steel floor framing.

Our ideal or standard fireproofing work as I conceive it would be a building planned first of all to meet the requirements of its use; secondly, with a view to proper fire-proof construction; that the building when completed should be a stove without a flue, and a stove with many compartments, in any one of which a fire might develop and burn itself out without being communicated to another compartment; or that it should be considered, in respect to possible conflagrations, as a fireproof vault protecting its contents from an attack from without.

In the present state of the art of building and with the present fixed habits or customs on the part of the users of buildings it is not possible to save the general interior finish of a building—the furniture, or, indeed, any of the contents—and we are therefore at the present time striving not to preserve the building and all its contents from fi[illegible] [illegible] and will be for a long time, that [illegible] rugs and rugs will be demanded until our staadard of comfort is changed; curtains, papers and books and all of the thousand and one articles that go to make up the contents of a [illegible] in preserving or willing to destruction the compartment in which it is placed.

Because our problem is largely one of salvage, economical considerations control us to a considerable extent in fire-proofing work.

It would undoubtedly be possible to construct a building which would withstand the attack of any conceivable outside conflagration and which would be so planned that a fire in any compartment could not possibly communicate to any other compartment; but such a building would at the present time be commercially impossible; therefore we are obliged to steer a middle course between what we conceive to be the best possible construction and the construction which is economically possible.

I have not given exhaustive attention to insurance rates, but so far as I have studied these I have felt that the insurance companies were not making fi-eproof building construction sufficiently attractive to owners by a reduction of rates.

I am not going to appeal to the conscience of the Insurance Companies, for an obvious reason; but I shall attempt to appeal to the intelligence, as they are the people who bear the burden, for the community, of the fire risk, and to suggest to them that so far as they stimulate the added investment of the owner's money in the fire-proofing of buildings, they are to that extent, perhaps to a greater extent, protecting themselves from the spread of great conflagrations and encouraging the rising of the standard of building construction, until such time—which is of course the millenial period—when fire insurance companies shall no more exist.

The fire risk as I have already indicated has two aspects; one the external risk from the burning of surrounding buildings, the other the internal risk from fire in any compartment.

The history of all the great conflagrations, such as the Toronto fire, the Baltimore fire or the Paterson, N.J. fire, shows conclusively that in any city, even the most modern, the risk from external conflagrations is much the greatest. In Baltimore there was a vast area of small, low poorly constructed buildings surrounding a few comparatively modern and reasonably well built structures; the fire, starting some distance from the high buildings, became, under the influence of the high wind, a long flaming torch which, lashing against the high buildings, at once pierced the windows and swept through these buildings from side to side.

The progress of the Paterson fire was much the same as in Baltimore; here the high buildings or fireproof buildings were seriously injured by the fire blazing in the surrounding, low, combustible buildings. A high building in an isolated situation is therefore subject to very great risks, much greater than would be the case with a low building in the same situation.

In the city of New York we had a situation which is, perhaps, different from any other in the world. There, by reason of geographical conditions and by reason of commercial habit, we have a comparatively small area where the most valuable business of the country is condensed, as it were, and where ground values are so very great that it is commercially possible to build to a great height and get large returns. We have consequently in New York a comparatively restricted area of very high buildings. That area is roughly from Battery Place to Fulton street and from West Broadway over to William street—a comparatively small area. There you have a large number of buildings in which there is a comparatively small percentage of inflammable or combustible material; but there are very few situations like that, and we have to contemplate the building of structures, conspicuous by reason of their height, in the midst of low buildings with possibly masonary walls but with timber floors, and therefore exposed to very great risk from without. My relation to fires in Toronto is indicated by that situation. I have had to do with this problem of an isolated high building in a busy commercial city, but a city which is, I believe, at the very beginning of its high development. I had the pleasure last evening of attending the banquet of this Association and I gained from that meeting, by listening to the addresses, a new idea of the possibilities of Toronto. But I believe you will see, as I, an outsider, will see, that Toronto is at the beginning of things; that you are probably destined to begin very shortly an area of very large building improvements, necessarily occurring in the central part of your city, and that you will have to face this question of fire risk in its commercial aspect, and for that reason I am going to offer you suggestions which have had their germination in my experience in Toronto. They are the suggestions of a man "red from the field" so to speak. I have had, by reason of other multitudinous professional engagements, very little time to prepare, and so I shall talk to you about the things which occurred to me and which are brought to me in my daily practice in Toronto and in cities of like character. I am assuming that you have to build structures with a steel frame. These frames are solely for structural requirements and to meet structural conditions. That is, you do not put into one or two thousand tons of steel any very large margin to take care of fire or anything unexpected. You make your steel just up to the limit and there you stop. Now if you are going to make that building reasonably safe from the standpoint of fire risk, you have got to protect that skeleton, you have got to put a skin on it; and if you are going to make it a really first class fire-proof building, you have got to put fat on it. [illegible]

How to protect this steel skeleton. Now at the outset, departing from timber constructions, architects supposed a steel member was fire-proof. There never was in the world a greater [illegible] were two large buildings constructed entirely of metal. The only parts of the buildings which were not of metal were the floors. The plaster was on metal lath; the trimmings and doors were of metal. That wreckage looked, from the river front, very much like a bird cage that had been put into a bonfire. It had sunk together, the wires twisted and matted together like hair. There was seemingly very little in the building to burn, and yet that steel cage was a wreck. That is the result which we find in every example of unprotected steel. There is nothing in the world more dangerous than unprotected steel. In the case of the Home Life Insurance Building in New York, which was destroyed or at least seriously impaired by a fire five or six years ago, we had the steel cage reasonably well protected with masonary, with fire-proof floors, and on the whole a first class example of the fire-proofing of that period. The stone front of the building was seriously damaged. Some of it had to be entirely replaced. But the most serious damage to that building was due to steel tie beams which ran across from one wing to another and which were not protected. The fire from the adjoining building, lashing against these steel tie beams, expanded them and threw the wings out of plumb. I have never seen a more striking example of the damage caused by an unprotected steel structure than that. The building was seriously damaged, but at the same time the salvage in itwas a very high percentage of the total cost, except for the fact that a man had put a steel beam across the court and had not protected it. If it had been protected the two wings would not have been disturbed and there would have been no task except the replacing of the stone work and interior trimming.

The task of repairing the building was exceedingly increased and rendered more difficult by that single unprotected steel member. We must therefore at the outset address ourselves to the task of protecting the steel skeleton. In an ordinary

situation the foundation is a negligible quantity. Our experience in recent conflagrations shows us that stone is one of the most dangerous materials to depend upon for the protection of the steel skeleton. None of the different stones meet even the reasonable requirements of fire resisting qualities. I had occasion to examine the burned district in Baltimore directly after the fire; and there I found a most interesting example of the unreliability of stone In the Government bonded warehouses, built about 1845. They were made with solid granite walls and interior piers, with groined arches between these piers. Absolutely solid masonry throughout. The granite piers were approximately two feet on the square. In one story of the building was stored a large quantity of alcohol. Fire was communicated to this alcohol by flying cinders from without, and the burning alcohol had absolutely burned out these two foot square granite piers. In one case there was no vestige of the piers left but a pile of sand on the floor. Absolutely gone. In other cases the piers were burned off, rounded off to perhaps a diameter of 12 inches. Nothing could be more untrustworthy than granite in a situation of that sort. Marble is almost but perhaps not quite as bad as granite. The limestones are a little bit stronger; but for fire-proofing purposes stone is practically out of the question and negligible.

We come then to the burned clay. I suppose there is nothing so good to resist fire as burned clay in one form or another. Certainly the test of actual use in conflagations indicates that well burned brick is the best protection against fire that we can have. If we could always use brick, the protection of our steel frame and the armour of our floors would be obtained. But we cannot always use brick. An architect does not want to use brick because it is necessary to embellish his façade. Therefore he very reasonably turns to stone or to terra cotta. Preferably to stone because it is more expressive. For one reason or another we cannot always use brick for the façade. Terra cotta is of course practically brick; except that it is made in thin members, generally with large voids; and whether it is structural or decorative it has these voids. We would suppose that terra cotta would resist any ordinary conflagration because it is burned at a very high temperature in manufacture. But in the Baltimore and also in the Paterson fire some of the terra cotta failed to a conspicuous degree. The lesson I deduced from the Paterson and Baltimore fires was that terra cotta was generally made too thin and that it was not burned at a sufficiently high temperature. Of course in the production of delicate shades and to meet the architect's desire to accurately match colour in the imitation of stone, or the matching of brickwork, they make mixtures of clay which will not bake very hard and which will not stand very great heat. As a matter of principle I think we should use terra cotta only in that form and that mixture of clay and those colours which will stand very high initial temperatures so that in case of a conflagration we shall have no failure. In the Baltimore fire there were examples of [illegible] of terra cotta under the influence of the torch of flame that I have before referred to. However, terra cotta has been regarded for a long time as one of the best fire-proofing materials. The forms used in the construction of floor arches have been considered very good; far in advance of any other fire-proofing method; and many acres of this work are in use and have stood the fire test very well. The fire test has revealed faults in the design of the partsIt is perfectly possible to [illegible] up against any ordinary structural stress. You [illegible] either of end construction or the old fashioned side construction, and it will stand up against any ordinary loading. For that [illegible] ordinary floor [illegible] as manufactur[illegible] market I am inclined to believe that it is exceedingly defective. Personally I prefer the side construction arch.

In the construction of the walls we come to the real joint in the armour. It would be idle to theorize about a building without windows. We must have windows of adequate size. If we did not we could not rent or use the space within the building, with any comfort. Consequently we must accept the window opening as a thing required; and it rests upon us to solve the question of protecting these window openings. The Insurance people have attempted to help us a little about this, but they have not helped very effectively. They tell us that if we put in wire glass they will reduce the rate so much; if we put in metal covered frames they will reduce the rate still more. I believe in the protection of window openings, but it is within the second class of duties; that is, it is an economic not a humanitarian consideration. I believe that, even theoretically, no perfect solution of the protection of the window openings has ever been put forward. I look favorably upon wire glass, and upon metal covered frames and sash, and indeed upon solid or cast metal frames and sash; but none of these have ever been thoroughly tested in a great fire and they are therefore a matter of theory. Nevertheless, it is easy to see that a metal covered or metal sash with wire glass would be a protection to the building. Because it is economic it becomes entirely a question of how much reduction we can have in insurance rates if we put in these particular features. Thus far the insurance people have not met the protection of buildings by this equipment with any corresponding reduction in rates.

Next to the risk from the window openings, we have the risk from the roof. The insurance people have recognized this; but the people engaged in actual construction have not yet realized that the roof should be as much a part of the fire-proofing as the wall. I have seen, in the Paterson fire, a roof covered to a depth of six inches with heavy cinders, which, after 36 hours, were still smoldering, and I have seen the steel frame of this roof, six inches below the roof armour, warped and twisted by that heat. Now it is not difficult to make a fire-proof roof except for the sky-lights. In the example of the bonded warehouse in Baltimore, which I cited, the weak point proved to be a sky-light. A flying cinder something like two feet in length and two inches thick, blazing, fell on the glass of the skylight and through it to the bottom of a light well, and there communicated fire to a single floor of that building, and the result was the disaster which I have described. But for that hole in the roof, the building was perfectly armoured. Wire glass would seem to have solved the question of sky-light protection. I am inclined to believe that properly used it may be the end of that question, provided that the glass is made heavy enough and the wiring heavy enough. If you do not use wire glass, you should use a wire mesh over or under the glass. I am myself using wire glass for sky-lights, not only for the fire risk but for the protection of those using the building below from the danger of breaking glass.

Now the interior of the building. Fire-proof floor arches have in many cases stood the test of heavy fires. Sometimes they fall. They are very apt to fall, not from mere incineration, but being weakened by the fire they fall from some slight impact from falling furniture, or perhaps the fall of a ceiling above. I have seen a pile of safes in a building fall through six stories. One on the first floor from the top fell by reason of the burning away of a six inch sleeper or skid under the safe. This drop of six inches took the safe through that floor, going through to the floor beneath, carrying that with it and so on in succession to the basement. I consider the upright arch as now constructed and as ordinarily purchaseable to be too thin, too near the margin. We shall come to heavier sections, and unless something else is produced I shall have to regard the terra cotta arch as the best thing available. The first conspicuous comparative test of concrete compared to terra cotta occurred in the Baltimore fire. There were very few examples of the concrete floor slab as compared to the terra cotta arch, but these behaved so admirably as to lead most of the engineers and architects who examined them to recommend the use of concrete. I am not prepared to go as far as that general recommendation. As regard concrete, [illegible] and properly, as one of our most valuable materials, and, if I could have it put in as I desire it, I would use it for fire-proofing in preference to the terra cotta arch; not because I wish to endorse the principle of concrete as compared with fire clay, but because I can make concrete slabs as I want them and I cannot make terra cotta arches as I want them. I believe a concrete slab—reinforced with steel somewhat beyond the structural requirements, that is beyond the loading tests, and with a sufficient thickness of concrete under the steel member to protect it from fire, forming thus a fabric continuous over the whole floor, with fibres of steel protected from any possible attack from the flame—is an infinitely better material than [illegible] There is a good deal of strife with respect to the merits of these two materials, and the reason I prefer concrete is, as I said before, that I can make a concrete slab as I want it, and I cannot make terra cotta arches as I want them.

For the purpose of fire-protection we must go far beyond structural requirements. The chief evil in modern practice in regard to fire-proofing has come from the supposition or from the decision by the structural engineer and architect that he had [illegible] have to put skin on the building to cover it; but if you are going to make it fire-proof you must put fat on the body.

[illegible] fire partitions as very important, except the enclosures of light wells and stair wells. I do not regard the [illegible] in one floor of the building, unless you make your partitions exceedingly thick, commercially impossible, you are bound to communicate that fire to other compartments. Structural walls may be made suffiriently thick to resist fire but it is not possible to make the mere partitions heavy enough to resist the fire. I have latterly discarded, within the building, all materials but hollow clay blocks, that is terra cotta blocks. There has been a resolute attempt in the last few years to introduce the reinforced concrete or plaster partitions. I believe in reinforced concrete for general use. I do not believe in it for partitions unless made so heavy as to resist a general fire. I have seen repeated examples of the failure of the thin solid partition. Take the case of a partition three inches thick, of plaster and sawdust, or concrete and cement, with a reinforcement of steel, it is reasonable to expect that it will fail. There is not enough fat on the outside of the steel to protect it from warping, twisting and falling. Ordinarily partitions will reach from 9 to 12 feet in height. When you consider a 3 inch partition, 12 feet in height, with a steel core member subjected to the heat generated even by the furniture we will say of this room, you will see at once that it is almost impossible that that partition should maintain its integrity. It is bound to warp and the moment it warps it is gone. So I believe in a comparatively thick but comparatively light material, and the terra cotta block meets this fairly well. I would always prefer a partition of considerable thickness; the difference in space is inconsiderable, the increase in the fire risk is very great, in the case of the thin partition; and for that reason I consider the thick partition, however light, as the safer thing.

In the construction of partitions, as indeed in the construction of floors, we depend on the cement mortar. As I said to you at the outset, I have no other intention than to make suggestions as to fire-proofing, and also in the matter of the Fire Code. If I recall the Code correctly, I could build here in Toronto fire-

proof partitions with lime mortar. Now I regard that as a very serious defect. I could, I believe, use Rosendale cement mortar. I think that is also defective. When you come to the revision of your building Code—and of course you will come to its revision, because a progressive community has to revise its Code every three or four years. I do not know whether I am touching local pride or not, but do not have any false pride about that. You cannot know as much now as you will three years hence. Therefore when you are three years older you must do something to your building Code. It is about three years old and perhaps you ought to do something now, but if you do anything about it you should insist upon the use of Portland cement for all fire-proof work. By Portland cement I do not mean a cement which tests up to 400 pounds under the 7 days test, but I believe your code—you will correct me if I am wrong—does classify all cements as Portland which test to 400 pounds in 7 days. That is not Portland cement. Rosendale or natural cement from some fields and under some conditions will test to 400 pounds, but that cement is an absolutely untrustworthy material in a fire. Portland cement, by reason of the high temperature under which it is burned in manufacture, will resist fire to a much greater extent than Rosendale cement or lime. For that reason I urge you to insist upon Portland cement, and in proper proportion. Mortar of 5 in 1, as a good many people use it, of 4 in 1, or even 3 in 1 will not stand up under a fire. It should not be expected to, and yet people do use it and do expect it to stand the test.

I have said nothing about the protection of light shafts and stair wells. It is perhaps unnecessary to dwell upon it further than to say that the walls should be strong enough to enclose a fire, and that the openings should be protected by automatic fire-doors. All that is possible, and your Code admirably provides for that.

Fire escapes come under the first consideration in fire-proofing. That is, it is a humanitarian matter. We must get people out of a building before they are smothered or roasted. A fire-escape does not need to be made of fire-proof material. I think wood is perhaps better than steel. A steel fire escape sometimes gets so hot that it is uncomfortable, and this occurs with steel before wood commences to burn. I came down a steel fire-escape in the Windsor Hotel fire, that was quite uncomfortably warm.

I shall conclude by calling your attention to this aspect. We have been for 15 years at least engaged in this battle with the fire fiend, and genuity galore has been exercised upon it. We have studied it conscientiously, and all of us, I believe, are conscientious in the expenditure of our client's money. But, let me say to you, gentlemen, that we are not half through the battle. If any of us live 25 years more we shall see such improvements in fire-proofing and the protection of buildings that we will be almost ashamed of the things we are doing today. I am striving with all my heart and soul to protect the buildings I put up, from the fire risk. I neglect nothing that is economically reasonable to protect them; and yet I believe 10 years from now I shall look back at these things and perhaps not be ashamed of them, but [illegible] shall not [illegible] pity at my present efforts as amateurish, so I ask you to study and try to solve this problem, which is so vital to us all, both from the humanitarian and economic standpoint. (Applause.)

The President: I am sorry, gentlemen that we shall not have much time for discussion, and any time we do take will have to be borrowed from that allotted to Mr. Langton. I [illegible] there are several insurance men [illegible] be pleased to hear from them with regard to any points they may have to raise, and Mr. Brainard [illegible] questions that may be brought up. [illegible] friends are too modest [illegible] be glad to hear from others in the room.

Mr. MacKenzie: Mr. Brainard did not mention the steel column. I would like to ask what he considers the best method of protecting the steel column?

Mr. Brainard: I am glad you asked that question. There were a lot of things I wanted to talk about, but the time is short. That is one of the important things. There is another which I forgot. I should insist that no steel member should under any conditions be covered with a less thickness than 2 inches. One of the faults in the terra cotta floor arch was that they put a thin flange, ¾ of an inch thick, under the steel beam flange, and let it go at that. A most fallacious practice. There should be 2 inches of fireproofing, either concrete or clay fastened to the steel, without any voids in every case. As to columns, which was the particular question, I believe first of all in filling around the column solid, so that all voids—that is if it be a channel or C-bar column—shall be filled with Portland cement. That is partly for rust protection and also for the purpose of filling all voids so that there will be no fire flue. Outside of that I would put 2 inches of concrete, with a steel reinforcement bedded so that the fire cannot get at it; or else fire clay, that is terra cotta, with steel binders, so that in case of fire it cannot fall off. I regard the steel tie embedded in terra cotta as one of the essential things, but I would have my column filled with cement for rust and fire protection, outside of that reinforced concrete or terra cotta.

Mr. W. R. Gregg: Mr. President, I have much pleasure in moving a vote of thanks to Mr. Brainard for his very useful paper. I am sure we all appreciate it. I do not wish to go into a discussion, but perhaps we may have on some future occasion an opportunity for a categorial meeting.

Mr. Gordon: I have much pleasure, Mr. Chairman, in seconding that motion.

The President: I am pleased indeed, Mr. Brainard, to convey to you the thanks of the convention for your admirable address. Among the many important points referred to, that of the periodical revision of our building Code is one of the most important. If we are going to progress we must keep pace with the art by improving our Code. I have very great pleasure in conveying to you the thanks of the Convention. (Applause).

TORONTO BUILDERS' EXCHANGE.

The annual meeting of the Toronto Builders Exchange was held on Monday, January 15th, at the offices of the Association, Yonge Street Arcade.

The meeting was well attended, and in the absence from the City of the President, the chair was taken by Mr. George Duthie, Vice-President.

The Directors report for last year gave a resumé of the work accomplished, and taken on the whole, satisfactory progress was shown. The present premises being too small for the growing membership, negotiations are in progress for more commodious and convenient offices.

The balance sheet for 1905 was a satisfactsry statement, and compared well with that of previous years.

As the last annual banquet proved so satisfactory the meeting decided to hold the next banquet at an early date:—The Board of Directors will appoint a committee to make arrangements for same.

The [illegible] for current year resulted as follows: President, George Duthie; 1st vice-president, Thos. W. Self; 2nd vice-president, C. W. Batt; treasurer, James Crang; Directors, Thos. Christie, J. R. Hoidge, John Aldridge, Henry Martin, John Maloney. Auditors, Geo. Clay, C.C.A.; Fred Holmes.

The following resolu[illegible] Seconded by John Maloney. That the retiring president, Mr. J. R. Hoidge, be tendered the thanks of this exchange for the [illegible] The president-elect, Mr. George Duthie, briefly addressed the meeting, asking the co-operation of members, in carrying out the work of the Exchange. The meeting adjourned at 5 p.m.

LONDON BUILDERS' EXCHANGE.

At the annual meeting on the 15th. inst. Encouraging reports were presented from all the officers.

The following were elected as the new officers for 1906:—President, Geo. C. Young; vice-president, John Whittaker; 2nd vice-president, Geo. Hyatt; secretary-treasurer, Geo. S. Gould; directors, Jno. Jones, A. Nobbs, Chas. Gould, T. Wright and D. Stratfold.

Several matters of importance were discussed, notably the Employers Liability Insurance. Some of the members have discovered to their cost that their policies are so hedged about with conditions that they are worthless to a building contractor. A committee was appointed to take measures towards rectifying this matter. It is felt that to deal with matters of this kind a Provincial Association is required. Such an association could demand and obtain the needed amendments to the Employers Liability Act and to the policies issued by the Guarantee companies to safe guard the interests of contractors.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached (not necessarily for publication). The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From an "Apprentice":—Will you please describe how to make an adjustable rack for a book-case so that the shelves can be moved to accommodate any sized book?

Ans.—We show in the illustration Fig. 1, 2, 3, how this may be done in two ways, Fig. 1 shows what is termed the zig-zag or saw-tooth method, which is very old, for supporting the shelves. A much better way and more simple is to take a piece of thin pine board, say half an inch thick, and bore a number of holes along the centre as shown in Fig. 3, with a fastener or other suitable bit, and then saw it down the centre. The sketch explains what I mean. Besides being made in far less time it is much stronger and neater than the older method.

From "Old Country Contractor":—I have the interior of a drug store to design and finish, the woodwork to be in white pine painted white, also prescription desk. The room is 31 feet long and 15 feet wide. Prescription desk or case to be in the rear. Please show a design for shelving and give me such other information regarding the finishing of shop etc., as you may think would be of use to Me.

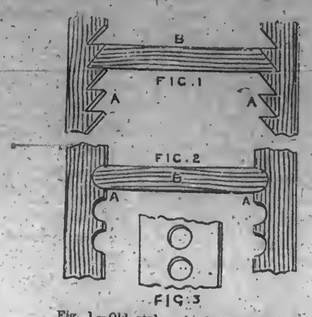


Fig. 1.—Old style. A, A, Uprights; B, Bearer. Fig. 2.—Improved mode. A, A, Uprights; B, Bearer. Fig. 3.—Mode of preparing uprights.

BEARERS FOR BOOKSHELVES.

Ans.—To answer all these queries in full would take up more space than is alloted to this department. However, we submit the following: Having determined the proper arrangement and dimensions of the counters, as well as the drawers, shelves, etc., in connection with the same, we may mention some of the remaining fixtures.

Fig. 4 represents a longitudiral section taken through the front window and main part of the store, showing a part of the elevation of one of the wall cases behind the counter.

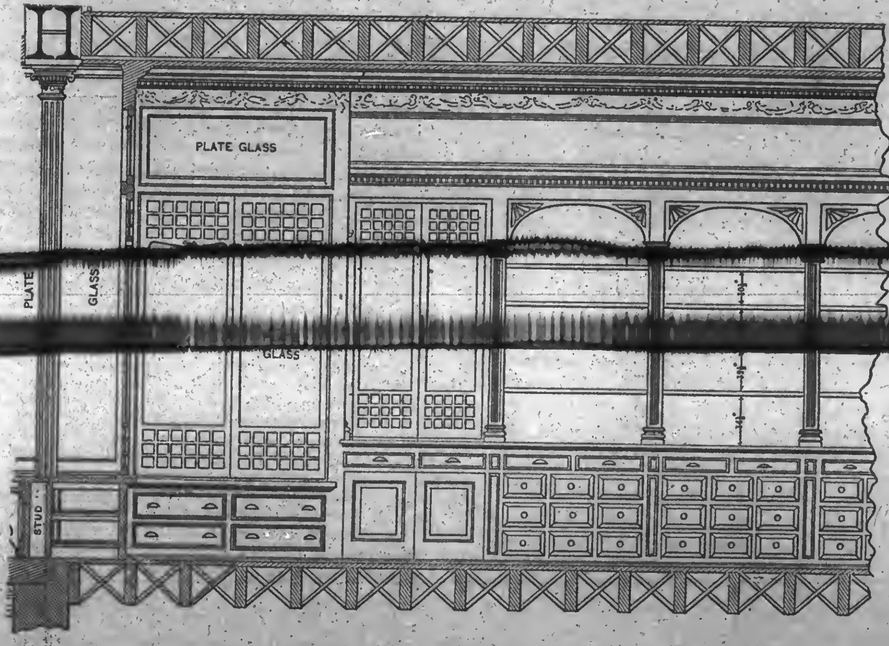


Fig. 4.—Interior of Drug Store.

This show window on the inside, is provided with sash doors glazed with plate glass, which may be hinged to swing in. The sash can easily be arranged to slide if desired, and this is, by some druggists, considered the better method, as the glass is not so liable to get broken, and the opening of the doors does not take valuable space. Underneath the window stool are two tiers of drawers for fly papers, etc. At each end of the case is a compartment for patent medicines and labeled goods. These compartments are also provided with glass doors to protect the goods from dust and flies.

The open cases between are for the different sized bottles and jars. The height of the shelves should not be less than the dimensions shown, and where possible should be somewhat in excess of those dimensions. In the lower part of the case may be closets for storing small casks of liquors, jugs, bottles, etc. The drawers are used for drugs. The above arrangement permits the proprietor to hide such goods as are likely to injure the appearance of the cases.

Fig. 5 shows the side elevation and Fig. 6 the rear elevation of the prescription case. The counter is of more than usual width, and has a desk at one end; two scales, one for coarse and the other for fine weighing, with a space for a row of mortars between, and a shelf

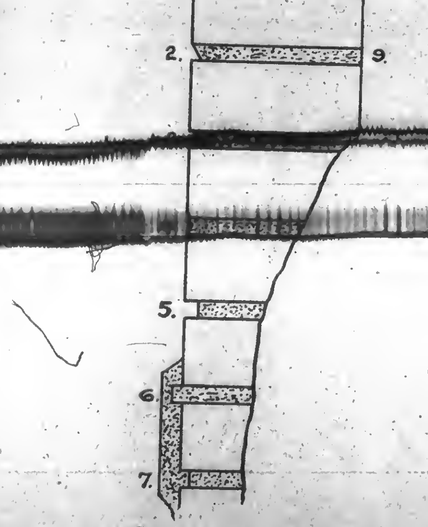


Fig. 7.—Joints in Brickwork.

for different sized graduaters, all in easy reach. The drugs which are most used are kept in the prescription case, and as the bottles are usually small, the shelves and the spaces between them are quite narrow. The space under the prescription counter is carefully divided into closets and drawers for empty bottles, pots, boxes, and utensils, so as to bring together the things in greatest demand.

The front of the prescription case should be glazed with ground glass in the usual manner. The desk for copying prescriptions and writing labels should be placed in front of a window. On one side there should be a little closet for prescription books, and on the other a closet for pills or tablets, which should be alphabetically arranged in tin boxes open at the top, and which should slide in on the shelves. The front of these boxes should be higher than the sides, to give space for the names of the different makes. Label drawers should be in this case.

Arrangement for pasting should be as follows:—Tinned copper paste holders should be set in hardwood boards which slide in the counters above the label drawers. The labels are laid directly on the boards, and the paste applied becomes so absorbent after being washed and scraped several times a week, that a dry place may always be found on which to place a label.

Much more could be said on this subject but equally as much must be dependent on the judgment of both builder and proprietor.

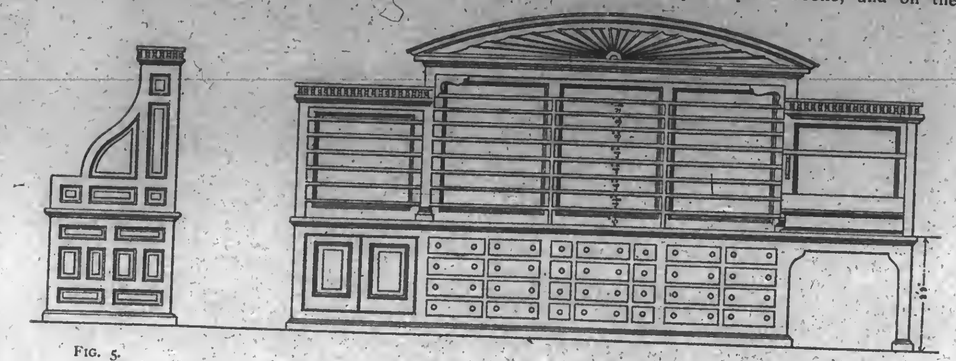


Fig. 5.

Fig. 6.
End and Side Elevation of Prescription Desk.

From "Bricklayer":—Please illustrate and describe the various joints used in brickwork and masonry?

Ans.—The following which is taken largely from "Mitchells' Building Construction" covers the ground [illegible] Bricklayer's [illegible]

1. Weather Struck Joints.—This is a very good joint, as the upper edge of the mortar is projected, and its inclination serves to throw off the water from the joint. Its appearance is also very good. See Fig. 7.

2. This type of struck joint should never be allowed as it lets the water lodge on the ledge formed and in cold climate, if the water freezes, it will chip the bricks and thus destroy the edge.

3. Keyed Joint.—It is not much used, though it improves the appearance of the joint by making it more distinct. It is made with a jointing tool with a curved edge.

4. Fat Joint Jointed.—The only defect this joint has is to make the mortar more dense.

5. Recessed Joint.—This joint is very pleasing to the eye, forming a deep shadow, although it should not be used in severe climate for the same reason as that given for the struck joint No. 2.

6-7. Keyed joints are sometimes made in this from when a wall is to be rendered.

8 Mason's V Joint.—This is the joint mostly used by masons.

9. Flat or flush joints are formed by the mason as the work progresses, the mortar being scraped off flush with the wall.

MONTREAL NOTES.

A short time ago a lady whose record for artistic accomplishment is somewhat beyond the reach of material missiles expressed the opinion when in Canada that this country lags behind in the finer works of the human mind. The reply she met with must have convinced her that there was more truth in her criticism than she had fancied. Certain of us have, however, higher aspirations. Sir Gilbert Parker has been urging us to remember that progress in material things will profit us little if we lose the "soul of things that matter". He suggests the foundation of a National Art Gallery and says that if Canada does not within ten years possess such an institution he would believe that the people lacked that spirit of imagination without which real progress is impossible. Recently we have a suggestion from one of our own aldermen that, as the inclusion of St. Henry, St. Cunigond and Villeray in the city is likely to lead to a state of congestion in the offices of the City Hall, a new and improved City Hall should be built on the Champ de Mars and that the present City Hall Building should be utilized as a museum and art gallery. Such a suggestion aims well but fails in two respects. The makeshift way of arriving at a museum and art gallery, apparently as a very passable way of utilizing a discarded building, is not the most likely to lead to the best results and further we cannot afford to lose the open space provided by the Champ de Mars. There is property on Craig street directly or almost directly opposite this open space which is crying out to be improved and which would form an excellent site for a public building. If it be objected that Craig street is not a fine enough locality for such a building it need only be pointed out that it is the widest of the down-town streets and is certain to become the finest. The recent widening of its continuation in St. Antoine St. will prove a great stimulus to its improvement, as it now forms a wide and convenient highway connecting the railway sta[illegible] west end with that at the east end of the city. The recent purchase of a large block at the corner of Craig street and St. Urban street by the Montreal Light, Heat & Power Company is likely to be followed, one may expect, by the erection of [illegible] substantial building, and a few more such will soon change the somewhat poverty stricken appearance of this part of the thoroughfare.

As regards the Museum and Art Gallery itself, we should prefer to see the subject approached from the point of view lately suggested by Professor Nobbs, that is, as an exhibition of skilled work having for its purpose the raising of the artistic quality of Canadian industrial products. Such a collection is an urgent necessity and would be a living influence and inspiration in our midst. An Art Collection made merely with a view to increasing the City's magnificence would be apt to sit like a gilded and neglected sarcophagus amongst our thousands bent on earning their bread by the sweat of their brows and with little time to spare for what has no obvious bearing on the work of their hands.

In the December number of the Canadian Architect and Builder attention was called to the general air of untidiness caused by the overhead wire nuisance in Toronto and if any Montreal councilmen are anxious to distinguish themselves as reformers of the aspect of the City they could not do better than begin by dealing severely with the companies which, by virtue of powers said to be conferred on them by Legislature, gaily make unsightly wildernesses of our streets.

According to the Building Inspector's report the total value of buildings for which permits were granted during the year 1905 amounted to $5,590,698, which is in excess of previous years. True to the reputation of the city for conservatism the character of most of the work shows no radical departure from customary usage. From a purely architectural point of view conservatism is oftener than not one of the highest virtues and in regard to the choice of materials one cannot be too glad to see the continued employment of and the grey limestone of Montreal and the district between Montreal and Quebec. It is true that the refractory nature of this stone does not lend itself readily to the sumptuous quality of carving that pretentious office building is supposed to require, and hence for such buildings Indiana and other sandstones from the United States are coming more into vogue, as in the Sovereign Bank Building in St. James Street, the uncompleted Lindsay Building in St. Catherine Street, the dressings of the building being erected for Messrs. Joyce in Phillips Square, and the recently finished Strathcona Hall in Sherbrooke Street. In the basement stage of these and many other buildings one sees more and more grey granite employed from the Stanstead and Mempremagog district. The buildings of Mount Royal Club and of the McGill Students Union, both in Sherbrooke Street, are faithful to the Montreal limestone and both have sufficient breadth of surface to exhibit well the unsurpassable delicacy of tone of this great stone.

In brickwork the facing of the Joyce Building, already referred to, in Phillips Square, affords a very agreeable innovation in a pale reddish brown brick made by the Montreal brick syndicate, and in the McGill College Avenue elevation of the Strathcona Hall [illegible] as well as in the new Hampton Court [illegible] Houses in Mountain Street, [illegible] of fair appearance, building six courses to the foot, has been employed. The Laprairie Brick Co., which has lately extended its manufacturing premises, is [illegible] consent of architects regarding the desirability of having on the market bricks of specially large and flat proportions.

Some experiments if only in a small way are being made in concrete building the purpose being generally the cheap construction of small dwellings. Some houses of this class have recently been built, out St. Denis Street, of concrete or artificial stone blocks. Another has been constructed with one foot walls of concrete thrown into boarded casings in situ. At the new Agricultural College Buildings, being erected at St. Anne's, the walls of the basement storey, carrying internal walls over, are made thus one foot and a half thick, but the external walls are of stone. The facing brick of these buildings are from Milton West. A novel experiment has made its appearance in the start of a new building apparently a dwelling or set of flats in Dorchester Street at the corner of St. Matthew Street. The basement, which is all that has been erected so far, is made of re-enforced concrete hollow walls. The face of the wall consists of L shaped slabs about 10 feet by 2½ feet and about 3 inches thick with the return end about 11 inches long. These are re-enforced with ¼" round bars the ends of which

stick out for the purpose of attachment to their neighbours. The inside of the wall is slabbed up with straight slabs of similar composition and means of attachment. The joints which are left wide are filled with cement. Internal partitions appear to be of single 3 inch slab construction. Until a floor has been constructed it is not clear on what the system depends for stability. As it is understood that not all is plain sailing between the construction and the city authorities results may be awaited with interest.

What is known as Roman Stone and is manufactured in Ontario has been employed in internal work at the Montreal Amateur Athletic Association's building in Peel Street in some small houses in Oxenden Avenue and is being used for dressings at the new Western Hospital buildings.

THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The Association met on December 19th to hear an address by Mr. F. Todd, landscape architect, on the subject of Civic Art. The lecturer naturally looked at civic art from his own professional point of view, pointing out the importance in regard to healthiness and beauty of good city parks and avenues. In most of the larger cities of the United States great efforts are be made towards civic improvement in this respect, and architectural societies are generally found actively encouraging these efforts. A series of stereopticon slides were shown, most of them being plans of cities, illustrating actual or prospective park systems. Mr. Todd pointed out how the general endeavour was to obtain, both within the city and without, a well distributed system of garden spaces and parks, and to connect these together by wide streets or avenues generally known as park-ways, these park-ways being themselves punctuated where practicable by little open square or circular spaces at the principal intersections with the city streets. Amongst the plans shown on the screen were Milwaukee; Portland, Oregon, with its future park system as approved, Baltimore with very irregular park-ways connecting its parks [illegible] with its three great Shawnee, Cherokee and Iroquois parks with connecting boulevards; Buffalo, St. Louis, New York, Kansas City, where circular [illegible] in Ontario, and Hartford, Conn., which has perhaps a larger proportion of open space per population than any other large city on the Continent.

The park system of Boston with which the lecturer had special personal connection came in for detailed description. The extent of irregular coast line and the windings of the Charles River give exceptional opportunities for varied and delightful parks and these have been taken advantage of to form what is probably the finest park system in America; not merely refreshing to the mind and eye but affording exceptional facilities for sea bathing, boating, playing grounds for children and gymnastic grounds for men. The spacious parks outside the city provide ample fresh air and holiday ground within access of the poorer classes of the community. A plan of Franklin Park was shown and attention called to the stately arrangement of the principal entrance and great formal concourse.

The new surburban Park at Winnipeg which Mr. Wood is at present occupied in laying out was next noticed. It is intended to have at the entrance a large formal circle so laid out as to confine the attention of the visitor on first entering to the artificial beauties of this particular limited space. Beyond this it is not intended to interfere with the naturally flat character of the park which will simply retain such beauty as belongs to the plain. The formal circle at the entrance is introduced to emphasize the contrast between the wildness of nature and the carefully tended and ordered work of humanity as the trimly cared for garden expresses it.

ARCHITECTURAL ACOUSTIES.

On the evening of the 13th of December, Prof. Cox, of McGill University, gave the Sketch Club of the P. Q.A.A. an instructive lecture on Architectural Acousties, limiting himself to an exposition of the work of Prof. Sabine of Harvard University on the subject. Prof. Sabine, in endeavoring to account for and remedy the acoustie deficiencies of the lecture room of the Fogg Museum, was led into making a long series of practical experiments which proved fruitful in tangible results. He had determined generally that good hearing in a hall depended on three chief conditions: 1st, the loudness of the sound to be heard; 2nd, the absence of distortion of sounds occasioned by the manner in which they were reflected from wall and other surfaces; and, 3rd, on the duration of reverberation in the hall. From his investigations of this last point Prof. Sabine had arrived at definite results of great practical value, and, while now engaged in investigating the other points, this is the only one on which he has published his results. They are briefly these: Halls in which the audible reverberation of a sound is long continued are bad for hearing in, owing to the confusion of each fresh sound with the reverberating remnant of the previous one. Prolonged reverberation may readily be reduced by the introduction into the room of absorbent material.

Preliminary experiments brought out three remarkable facts in regard to the duration of audible reverberation in a room: 1st, that it has no relation to the position of the [illegible] being the same for all positions; 2nd, that it continues the same length of time in all parts of the room and is independent of the position of the audi[illegible] the sound absorbing materials, provided their exposed area remains the same. These may thus be provided on ceiling, wall or floor as may be most suitable.

Professor Sabine has succeeded in measuring, with very considerable accuracy, the relative capacities for sound absorption of different substances. Experiments gave the following results, in which the loss of sound occasioned by one square yard of open window is taken as the standard:

Open window	1.00	Plaster on tile	.025
Wood-lined walls	.061	Brick set in cement	.025
Plaster on wood lath	.034	Carpet	.54
do on wire lath	.033	½" hair felt in front of wall	.78

On the same basis the absorptive capacity of an audience of people was found to be .40 per person when seated and about .44 when standing. Women in this relation are found to be quite perceptibly more absorptive than men, in about the proportion of nine to eight.

Too long reverberation is the most frequent cause of bad acoustical quality in halls, and its duration may be quite accurately determined beforehand by ascertaining the value of t in the equation of the hyperbola, $(a + x)\,y = K$, in which $(a + x)$ represents the absorbing capacity of the exposed surfaces in the room together with that of the audience, whilst K is a constant proportional to the volume of the room. The duration of reverberation is thus inversely proportional to the absorbing capacity of the room and its contents. In the case of the Fogg Museum the duration of the sound was successfully reduced from a little over five seconds to about two seconds. For concert halls, a duration of about 2·30 seconds is desirable, to give fulness of tone, whilst three seconds would be too long. For lecture halls a shorter duration is desirable. The New Music Hall at Boston is designed with a duration of audible reverberation of 2·31 seconds.

In answer to questions asked at the end of his lecture, Prof. Cox said that, while Prof. Sabine had treated the question of the form and proportion of a room as of comparatively little importance, it should be remembered that his work so far dealt only with reverberation, and that his further investigations might illustrate the importance of these matters in certain cases. Prof. Cox's own personal experience, in speaking in rooms of different form, led him to believe that the form of the room, its proportions and the position of the speaker had much to do with good acoustics.

THE P.Q.A.A. SKETCH CLUB.

The Club held its annual general meeting on the 20th of December. The Council's report showed that in addition to three preliminary meetings and two visits held in the spring the Club had had ten weekly meetings in the winter session 1905 including the opening meeting, two lectures, two sketch design competition meetings, three book reviews, one general discussion and an exhibition of measured drawings. Besides the sketch design competitions, two monthly competitions in design had taken place and a prize for measured work awarded. [illegible] lows: President, C. S. Burgess, A.R.I.B.A., Vice-pres., J. E. Fortin, secretaries Al. Wright and R. Charbonneau, treasurer, F. Peden.

Members of Council [illegible] Louis Labelle, W. Haldane and A. J. King.

Our ancestors had only a few materials, which they thoroughly understood and used in the most direct and unflinching manner. If they did not know the chemical and physical properties of these materials as well as we do, they had a practical insight into their working, which is of far more importance in design than the most profound analysis.

MOVING A BLOCK OF HOUSES.

The construction of an extension to the Thirteenth Regiment Armory, in Brooklyn, N. Y., required the removal of two rows of brick houses adjoining. It was at first proposed to pull them down, but they are being moved bodily to a site 300 feet away but round a corner. One block is already moved, the other is in process of preparation. The work does not differ from other removals except in the size of the mass and in its irregularity. The block moved is about 90 feet long, of buildings stone fronted but not substantially built, erected at different times, with thin double party walls and varying projections in the rear; one house had a three-storey bay window in front. To turn the corner the pushing jacks had to be operated with a greater number of strokes for each unit of distance from the pivotal end. When half way round the process was reversed; the forward wheeling end became the pivot and the former stationary end was pushed back. After reaching their required position the buildings were lowered 6 feet to place.

KNOT FOR TYING SASH CORDS.

A correspondent of *Carpentry and Building* writes: I enclose a sketch showing my method of tying a knot

in sash cord. The knot is shown tied loosely in order to clearly indicate the manner in which it is made, but [illegible] against the weight, thereby causing the latter to hang plumb and true.

Men were not born equal, the axiom is false; but each is given a sphere wherein to work. The vessel that holds not water may still hold grain. It matters not so much what a man cannot do as what he can. In the struggle for world-supremacy, it is the fittest that survives and gains the mastery.

Do You Desire to Interest Manufacturers

If you want to sell anything to the manufacturers of Canada it would be good policy to talk to them direct. To do so to best advantage you should

ADVERTISE IN

CANADIAN MACHINERY AND MANUFACTURING NEWS

Montreal Winnipeg Toronto

WOOD FIBRE PLASTER

IMPERIAL PLASTER CO., LIMITED, KING STREET WEST, TORONTO

THIRD EDITION

Canadian Contractor's Hand-Book and Estimator

The third edition of the Canadian Contractor's Hand-Book is now on sale. The book has been revised and enlarged to upwards of two hundred pages, and the title changed to the Canadian Contractor's Hand-Book and Estimator, considerable matter bearing on the cost of performing various kinds of work having been added.

The price of the third edition, mailed free, is $1.00 to subscribers of the CANADIAN ARCHITECT AND BUILDER, $1.50 to non-subscribers. Order from the publishers.

The C. H. Mortimer Publishing Co., of Toronto, Limited.
Confederation Life Bldg., Toronto.

Branches: 38 Allanee Bldg., Montreal; 720 Union Bank Bldg., Winnipeg
536 Hastings Street, Vancouver, B. C.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3. VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in anvance. The Journal will be discontinued at expiration of term paid for. If so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 15th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT - EDMUND BURKE, Toronto
1ST VICE-PRESIDENT - W. A. LANGTON, "
2ND VICE-PRESIDENT - S. G. CURRY, "
TREASURER - H. B. GORDON, "
REGISTRAR - W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY - Toronto
JOHN E. BELCHER - Peterborough
J. W. H. WATTS - Ottawa
A. H. GREGG - Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT -
1ST VICE-PRESIDENT -
TREASURER - J. R. VANIER, Montreal.
D. R. BROWN.

Montreal.
Montreal.
Montreal.
Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS. W. SELF, 1st Vice-President.
C. W. BATT, 2nd Vice-President.
JAS. CRANG, Treasurer.
H. MARTIN.
THOS. CHRISTIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD O. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO. WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 471 English St.
J. JONES.
CHAS. GOULD.
T. WRIGHT.
H. STRATFOLD.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. COOK, President.
R. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADBURY.
C. P. SHINDLER
K. M. FOAKE
E. C. BAYNE.
D. BAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. H. PORTER, Secretary.
A.T. DAVIDSON, 1st Vice-President. T.D. ROBINSON, Treasurer.
G.BURGRAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms
Directors: T. O. Latimer, E. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alslp, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Colter, T. A. Girolo.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAMB, Hon. Treasurer.
J. HERBERT LAUER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS.
JOHN GRAY,
GEO. H. WOOD,
Past Presidents

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN - Chairman
H. W. WHITTINGTON - Secretary
THOS. CATTERALL - Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President
G. MENARD, 1st Vice-President.
T. CHARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAUKAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. E. COTE.
LOUIS PAYETTE.

THE BILLBOAD MALADY.

In pointing out that billboard advertising has been largely relegated to liquors and nostrums, the Massachusetts conference for village betterment has touched the weakest spot of the feeble form of publicity. Always offensive to good taste, the billboard is daily growing more so by the loss of patronage of advertisers who are careful of the company they keep. When this process of elimination goes far enough, the billboard will become a medium for only the advertisers that cannot get a hearing through respectable channels. Then probably laws will be passed that will rid the public of this nuisance for good and all.—*The Western Architect.*

The Don Valley Brick Works

are ... ing

DOROUS

TERRA COTTA FIREPROOFING

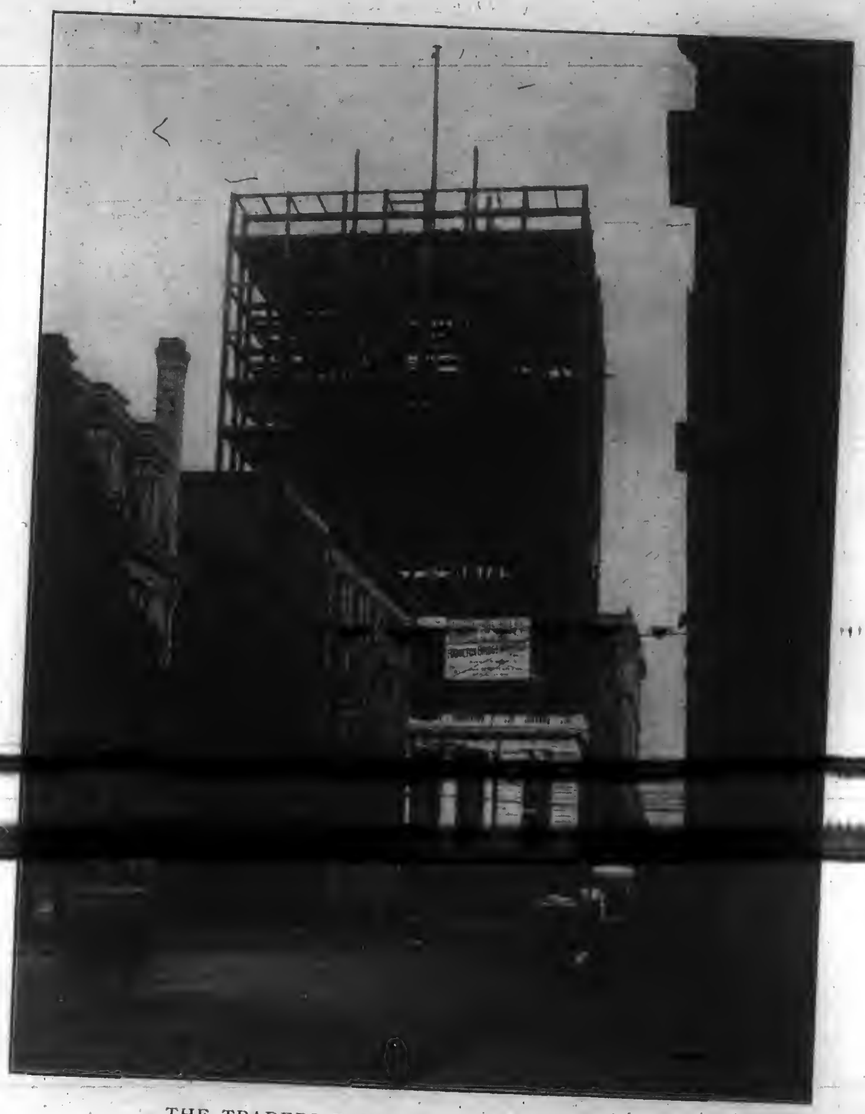
IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices



THE TRADERS BANK OF CANADA BUILDING.

MESSRS. CARRÈRE AND HASTINGS, NEW YORK,
MR. F. S. BAKER, F.R.I.B.A., TORONTO,
ASSOCIATED ARCHITECTS.

VIEW OF STRUCTURAL STEEL-WORK.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1906

THE TRADERS BANK OF CANADA BUILDING, TORONTO.

MESSRS. CARRÈRE AND HASTINGS, NEW YORK,
MR. F. S. BAKER, F.R.I.B.A., TORONTO,
ASSOCIATED ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JANUARY, 1900

ENTRANCE TO No. 30 ST. JAMES STREET, MONTREAL.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 219. FEBRUARY, 1906.

ILLUSTRATIONS ON SHEETS.

Plan of Improvements to Toronto.
Proposed Water Front for Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Canadian Bank of Commerce Branch on Yonge Street, Toronto.—Messrs. Darling & Pearson, Architects.
Doorway on the Esplanade, Quebec.

CONTENTS

Our Illustrations	17	Heating Fruit Cars by Ice	iii
Toronto Builders' Exchange Dinner	17	Municipal Heating at St. Thomas	iv
The Plan of Improvements to Toronto	18-19	Quick Work	ix
Plumbing and Sanitation	20-21-22-23-24-25	The Master Painter as an Educator of Original Decorations	x-xi
Intercommunication	26	Westminster Palace	xii
Wrecking Buildings	27	A New Idea in Concrete Steel Construction	xii
The Foundation of the Capitol at Albany	28	Technical Training	xiii
P.Q.A.A. Annual Meeting	29-30	To Encourage Native Art	xiv
Mr. T. G. Jackson's Letter on the Danger of Using Iron in Buildings	ii	Curing Concrete Blocks	xv

OUR ILLUSTRATIONS.

THE PLAN OF IMPROVEMENTS TO TORONTO AND PROPOSED WATER FRONT FOR TORONTO

are referred to elsewhere in this number, in Mr. Walker's speech at the dinner of the Ontario Association of Architects and Mr. Langton's address in presenting the plan to the Association at its Annual Meeting.

CANADIAN BANK OF COMMERCE, BRANCH ON YONGE STREET, TORONTO.—MESSRS. DARLING & PEARSON, ARCHITECTS, TORONTO.

The annual report of the Bank of Commerce stated that the handsome branches which the bank is building, not only in the cities but in the country towns, are a good investment. This is [illegible] for the numerous branches, which not only this bank but others are building, are a great addition to the beauty of our cities and towns. Part of the satisfaction they give to the taste is without doubt due to their singleness of purpose. There is usually no visible conglomeration of ends—a bank above and offices below. And the evident testimony to the solid financial position of the corporation which this appropriation of a valuable site for a single purpose gives, adds considerably to the appearance of dignity and character which the same causes—simplicity and definiteness of purpose—give to the design.

DOORWAY ON THE ESPLANADE AT QUEBEC.

The Montreal architect who kindly sent us the photograph from which our illustration is taken, describes this doorway as being of wood placed in a simple stone front.

THE CANADIAN ARCHITECT AND BUILDER COMPETITION.

Our space, both in the text and in the illustration sheets which go with the Regular Edition, is so taken up this month that we can only announce the decision in this competition and leave the publication of plans and of the judges' report to our next issue.

The prize winners are: First, Mr. E. H. Yeigh; Second, Mr. W. B. Van Egmond, and Third, Mr. Victor G. Steer. The judges were Messrs. John Gemmell, C. H. Acton Bond and J. Francis Brown. We retain also, for publication, the drawings by Messrs. S. Douglas Ritchie, W.L. Somerville, and Albert Pollard.

BUILDERS' EXCHANGE DINNER.

The third annual banquet under the auspices of the Toronto Builders' Exchange took place in St. George's Hall on the evening of the 22nd inst., when there were present upwards of 250 persons, including many ladies. Mr. George Duthie, president of the Exchange, presided.

The programme was original and attractive, being in the form of a four-page note-book, the cover being of blue print paper bearing a design of a wall under construction, surmounted by a [illegible] and beaver. The menu was fashioned after the manner of a building, the first course being at the bottom of the page, with the advice, "beg[illegible]"

After the banquet an excellent [illegible] and speeches was given. The National Anthem having been sung in response to the toast of "The King", Rev. A.L. Geggie proposed the toast of "Our Country," which was replied to by Hon. J. W. St. John. Mr. C.W. Batt proposed "Our City", to which Alderman Graham replied. "To Sister Associations", proposed by Mr. John Aldridge, Messrs. E. Burke and H. Simpson, of the Ontario Association of Architects, and G. C. Young, President of the London Builders' Exchange, responded. The latter urged the Toronto Builders' Exchange to take the initiative towards the formation of a Provincial Association. Then followed the toast of "The Ladies" and "The Press", proposed respectively by Messrs. Frank Saunders and T. Christie. Those who contributed to the musical programme were Miss Violet Apted, Mrs. Mildred M. Ritchie, Miss Lillian Landell and Messrs. J. H. Cameron, J. Robert Page and A. F. Saunders.

The following gentlemen composed the Dinner Committee: Messrs. Frank Saunders, Chairman; J. L. Phillips, Secretary; A. Dinnis, F. Holmes, H. Elgie, J. M. Gander, Isaac Price, J. B. Thomson, A. G.

Saunders, Geo. Duthie, Jas. Crang, Thos. Christie, Wm. Smallwood, Walter Davidson, Jno. Scott, J. B. Vick, H. Martin, J. R. Hoidge, Wm. Pears, Geo. Britnell, R. Stanley, T. W. Self, C. W. Ball, Jno. Aldridge, Jno. Maloney, Geo. Gander, Jno. Logan.

THE PLAN OF IMPROVEMENTS TO TORONTO.

SPEECH OF MR. BYRON E. WALKER, GENERAL MANAGER OF THE CANADIAN BANK OF COMMERCE, AT THE ANNUAL DINNER OF THE ONTARIO ASSOCIATION OF ARCHITECTS.

Mr. President and Gentlemen: I have to thank the Ontario Association of Architects for giving me the opportunity of being here to-night and of speaking on this subject; one that has certainly been very dear to my heart for many years. I shall, I suppose, have to try to say something that has not been said before regarding this plan; but this is a rather difficult task after the very thorough manner in which Mr. Langton dealt with the subject and after what has been said by the Mayor and Sir Henry Pellatt. I think we should try to consider the reasonableness of bringing this plan before the people of the city of Toronto at this particular moment. The growth of a city begins generally with the cross roads in the country, developing into village and town and city; it has usually no shape, no rationale, no reason for being, except the gregarious instinct of man, and in a new country it is apt to grow a long time before people begin to think about its rationale at all—as to why it is there and what its purposes are. As Mr. Langton said, in the middle ages cities did not have sewers or other improvements and conveniences; they were mere habitations of men crowded inside a wall. Now there is nothing very unnatural to me in the position of Toronto at the present time. It has had in the last fifteen years an extraordinarily rapid growth. If we put ourselves back to the time when it was a little place clustered about the Don, and consider that it has now reached almost to the northern reaches of the Humber, we shall realize at what a tremendous pace Toronto has grown in the last few years; and if we suddenly find that we have outgrown our proportions and have to consider afresh the scope of our city, that I think is very natural and we need not spend time in deploring a mis-spent past. It occurs to me to say this because [illegible] addresses, largely about the sins of Canada in wasting her forests in the past and as to what we are to do in the future; and it seems to me that deploring the past is after all a waste of time. The question now is whether Toronto has reached the point where it should consider its surroundings and its future, and whether it has the courage and intelligence to do those things which every one of us know ought to be done. (Hear hear.) Now we have 300,000 people—so the Directory says, and if it is not quite true, it is approximately true. One of the enterprising journals of Toronto recently started what is called "The 500,000 Club." I believe most of the business people in Toronto believe it is quite practicable to give an impetus to this city which shall cause it to have 500,000 people a great deal earlier than it would have without this impetus. If we do not believe this, then we are not like the the rest of the people in the western world. In the United States cities are often made by the efforts of 15 or 20 leading men. A small percentage of the people believe intensely in their city, their patriotism showing itself in an intense love of that particular part of the earth, and these men make it what it is.

The question that devolves upon the people of Toronto is, whether they believe in this scheme; not as a pleasant after-dinner diversion; not as a thing, which gentlemen who may be too enthusiastic have taken the trouble to develop into a coherent plan; but as something which the people of Toronto will take hold of and commit themselves to as a programme for the future, taking all the necessary steps by legislation, or otherwise, to ensure that this is the plan which Toronto proposes to follow for the next 15, 20, 30, 40, or 50 years, and authorizing, as far as they can, that money, in a natural way and so as not to be too great a burden, shall be spent year after year, in order to bring about its completion.

We need not deceive ourselves by imagining that if we go away from here to-night, and the Architects and all those who have been concerned in it have been thanked for their love of our city and the energy and intelligence they have displayed in the development of the plan, and we have got the assurance of the Mayor and others that in a general way all believe in it and hope to see it worked out—we need not imagine that any great result is going to flow from that alone. We are not going to have any result unless this plan, or something akin to it, takes the form of concrete legislation. This plan has been developed by the careful study of skilful men and is as perfect and intelligent as these gentlemen know how to make it. Doubtless, however, it has faults and may be altered to advantage in some respects, but let us say that a plan evolved by a little alteration of this should be accepted and confirmed by [illegible] otherwise, as the plan which Toronto proposes to follow in developing these important roadways and in developing its parks. (Applause.) When that has been done; when such a plan has, with its consent been imposed by the Province upon the city of Toronto, at I hope the urgent request of the present Mayor and of [illegible] we have all said as citizens—both as individual citizens and as we are represented in the Council—that this is what we propose [illegible] that city—a plan modelled on a comparatively large scale and put in some public building of Toronto, so that every man who comes to Toronto may go and see it and realize what we are going to be 10 or 20 years from now. (Applause.)

When you think of people like the Americans, so impetuous and so ambitious that one can hardly imagine them projecting anything that will take more than a year to accomplish—when you think of a people like that, having a plan which will take a hundred years to carry out, at an expenditure of $2,000,000 a year—when we realize as some of us can, as anyone who saw Washington 20 or 30 years ago can, that absolutely desolate mud-hole and sand flat on the banks of the Potomac, and consider what they have already done and what they believe they can do, not by natural advantages but by forcing beauty out of most unnatural situations—what kind of people are we in Toronto if we think we have not something serious to do? It would be absolutely unnatural if at this stage of the history of Toronto we had not something very serious to do. The real point is, not that we have it to do but at this moment when we are touching 300,000, when we have had a most extraordinary growth, when the people of Montreal are wondering if Toronto is going to wrest the supremacy of trade from them, wondering why the people of the west deal more at Toronto than in Montreal, when we see this, are we, the people of Toronto, ready to seize the advantage which is ours at the particular moment, and surround our city with forms of beauty and convenience, with just those things which every man would like to have about himself and which we as an aggregate of citizens must desire to have about ourselves? Are you going to attempt these things, not regarding them as dreams for the future, but as the absolutely essential things for a self respecting city which has a care for the health of its people, for the easy transportation of its citizens, things which cause people to desire to come and live here—because men who sneer at architects still somehow choose places to live in that happen to be beautiful, somehow or other they have that much sense? (Applause).—Are we then as citizens going to take the steps, the serious steps which will involve making all the leading men interested in Toronto—men like Mr. Hays, who was here yesterday, (I talked to him about this plan and he was quite interested in it,) the officials of the C. P. R., Mr. Mackenzie, the Toronto Street Railway, every interest there is in Toronto—make all these people firmly impressed with the fact that it is necessary to make this a city that it is good to live in. Are we going to make them all feel this so much that we will take this plan, or something developed from this plan, and make it a law for the people of Toronto which no new Council can change—they would have to go to the Legislative Assembly to change it. And then shall we say that we are ready to spend the money necessary to carry it out?

Now let us consider what the spending of the money means. The President spoke about me as being interested in the artistic side, but I fancy it was intended [illegible] speak about the financial side. When the new Government in Ontario came in, I was one of those who had charge of seeing whether we could get some money for new buildings for the University of Toronto. We needed half a million dollars, and the very prudent treasurer had said to Mr. Whitney that he did not know where they could readily find half a million dollars. This difficulty was pointed out to us and I was the one who was to present the financial situation to the Premier. I said to the Premier, that in Ontario we always talk about giving cash subsidies to railways of $3,200 a mile, but we never give any cash, we give annuities for 30 years based upon 3-1/2 per cent. and issued in such a way that the railway can sell them to get $3,200 or thereabouts for them. Why not help the University in the same way? $30,000 for a term of thirty years will give us all the money we want. Mr. Whitney had only to hear this and it was done. Now, if the city of Toronto by legislation through Parliament, levies a tax rate for a particular purpose and which must be levied every year, it can realize relatively an enormous amount of present money against this, without a very heavy tax rate in any one year. I believe the income from a great deal of property, which the city owns and which is not necessary for civic purposes, belongs to the Parks and Gardens Committee. However that may be, we might spend apart from this, say, $100,000 a year. If $100,000 is so raised each year, and if no incoming Council can divert this particular item, it becomes part of the uncontrollable expenditure, and we can do an enormous amount with such a power of taxation as that. Now if we raise that money and spend it, not in accordance with the particular view of any particular council—and this is not said in criticism of what any particular council has done or may do, it is said in criticism of the system which causes a new set of men to be elected every year who may not have ideas consistent with those of previous councils—but if we can have another set of men so organized that a coherent idea will run through that body, and if this money is spent in accordance with a plan which has been approved by the Legislative Assembly, we can in 10 years do so much that I am convinced our people would be impatient to see the rest of the plan carried out. (Applause). If such a plan were made law, and a model of it erected in the City Hall or somewhere else for people to see—I should also like to see it printed in colours in every directory published in Toronto and in every other form in which the map of the city is published, so that the people will have before them always the problem which they are trying to accomplish—and if we are hewing to that every year, we shall soon see that the people of Toronto will be behind us in a most uncomfortable way to get the plan pushed ahead and finished.

Now I lived in New York not very many years after Central Park was created, and very few people lived above the lower part of Central park. I am unfortunately old enough to remember hearing New Yorkers deplore the folly of building Central Park; how absurd it was to take a lot of swamp and rocks and muck-heaps and turn them into a park, miles in advance of settlement. And I have seen the City of New York applying to the Legislature for power to buy park [illegible] which were miles above the then boundary line; because they knew what the requirements of the city would be and if they waited until such land was in the city limits and then sought to buy, the problem would have become almost impossible. Now you can start at Central Park and drive miles through parks and these have all been created in the last 20 or 30 years, and many have been bought when they could be bought by the acre. I mention this because the Mayor seemed to think there would be some difficulty in buying, for instance, the banks of the Humber. But it Ontario is the same as elsewhere in the matter of Municipal Government, there would be no difficulty in our getting power to buy land beyond the boundaries of the city. So far as the city is concerned we can remember the time when it was perhaps a third of its present size, and the general impression most people had of Toronto was that it was an unusually uninteresting place. It was not exactly flat, but a flat slope. Now that it has grown larger and by means of street cars we can reach the Humber and the Don and the Rosedale valleys, we realize that it is not by nature an ugly place at all, but that it is by nature a very beautiful place. We realize also that much of the land around Toronto is of no use for agricultural purposes and that there surely never

could have been a city anywhere that has so much land at both ends and at the back as well, suited for no other purpose than for waste places. It is a pleasant idea, "waste places", a beautiful idea, because it after all means tracts of land that men cannot cultivate and which have to be left comparatively in a state of nature for the benefit of man. Let anyone go out to the beautiful Lambton golf links and see what has been done there with great ease. We can have with as little expense as any city of the same size, a wonderful investment of parks. We know to a certainty that every year we postpone the purchase of any such land we shall have added to its value just exactly what the steady outgrowth of the city of Toronto towards the land means; and if there is land one mile from a settled part of Toronto, which can be bought at a certain price, if we wait five years we shall have to pay the extra price which is represented by five years of the growth of the city towards that land. The common sense of any man who thinks for a moment shows him that some day the city will want these parks, and if we can get money in any way to secure them, we should buy them now and not wait until the real estate vendor or the process of expropriation causes us to pay enormously as compared with what we should have to pay at the present time. (Hear hear.) To me, gentlemen, it is not a question of the city beautiful, it is just a question of practical common sense. Do we really believe in the city of Toronto; do we believe it is going to be one of the great cities of North America? Do we believe that beautiful surroundings, fine roads for driving, fine highways, to let your people get in and out, will pay? One of the serious troubles of modern cities is the incoming of the people from where they live and the exit at night—we have to go out now in zigzag fashion and we know full well we cannot continue to do that, we must have radials to take the people out, and shall we begin to buy these radials now or at a time when they will cost 5 or 10 times as much as now? And let us consider that if this were done in such a manner as Sir Henry Pellatt suggested, by means of a commission, the purchase of these radials might be managed in such

that scheme involves the widening of York street. Could not any five gentlemen in this room, if they had the power to buy the land on both sides of [illegible] up to Osgoode Hall or obtain it by expropriation, effect the widening of it so many feet on each side and sell the new frontages so as to make money out of doing it? It is clearly possible to take the land on York street, buy it, dismantle the houses, widen the street, sell new business sites and make money. When you build the radials you could not do that throughout, but if a commission bought every block that would be intersected by the radials, and controlled the rebuilding on their blocks, do you think we have not men in this city who, if empowered by a proper commission and put in such a position that their ideas could not be changed every time a new Council came in; would not for the love of it, manage business like that and do it without the cost being at all a serious matter. My idea is that what seems the most expensive part of that plan would be the least expensive if managed in a business way. (Applause). Without trying to say what it is going to cost, do you mean to tell me that the 300,000 people in Toronto at the present time, among the most liberal spenders of money in America, cannot afford to buy such surroundings in parks and boulevards as other cities in North America have? And can they not afford it much more than cities in Europe? In Europe it is true that labor is cheaper than here, but all the improvements are so much more solid and lasting than ours that the money they have to spend is out of all proportion to the money we spend.

My last word to the gentlemen here—or rather to the people of Toronto, who I hope will hear of this meeting—is that this is not a diffiult question practically, this is not a difficult question financially; it is really a question of whether the people of Toronto at the present time are going to join the movement which is taking place all over Canada—there is a larger movement in railway building, in banking, in the distribution of goods, a larger feeling from one end of the country to the other—whether the people of Toronto have got into this movement and into this larger wave of action enough to do the thing for their own city, which is not only eminently reasonable but is to the last degree necessary.

PLUMBING AND SANITATION.*

Forty odd years daily experience in the theory, and practice of modern plumbing—I use the word in the broad sense of its meaning as generally understood by the public (covering the allied trades of heating, roofing, etc.)—and a consequent intimate contact and association, with the architect, his client, and the general public warrant me in making the statement, that there is nothing that so quickly makes and assures the architect's reputation as good plumbing—and nothing so rapidly, surely and often injustly, mars his reputation as faults in connection with this important and complicated branch of the building trade. Let the foundations be laid never so well—the facade, be architecturally correct, the interior plan be faultless, decorations unique and artistic—all is quickly forgotten, should drains choke, roof or water pipes leak or the heating apparatus fail in giving the desired temperature. The proprietor [illegible] plumber, artist, plumber and only remembers his architect, when such troubles arise. True the plumber comes in for a certain amount of the blame, and hard [illegible], he has at least a certain amount of justification, and a ready excuse is afforded him when he can say "I followed out your architect's plans and specifications," and if he has done so, does not his responsibilility outside of the workmanship end there? At least I know that in many cases he thinks it does. And he the plumber ever so much in fault the proprietor still blames the architect for his want of knowledge in employing an unskillful or characterless man.

Such being the case, the question arises how you are to minimize the risks you run in such matters, for the best of pipes will leak, drains will choke, fixtures overflow, and through no fault of either plan or practice.

Consider for a moment what the plumbing apparatus in a modern dwelling is. In even a small and unpretentious house, it is a most complicated and intricate collection of material that have to be assembled in a skillful manner and according to highly scientific

*A paper by Mr. J. W. Hughes, Montreal, read before the Sketch Club of the Province of Quebec Association of Architects.

principles, if the desired results are to be attained, and, once completed, it receives little or no thought or care on the part of the owner or user; such as a similarly complicated and expensive apparatus would receive daily if it formed part of the plant of a manufacturing concern. No one even thinks of seeing that moveable parts, from time to time, are oiled; that lost motion is taken up; that nothing is done with, or to it, except what is legitimate, and according to the intention and purpose for which it was designed, and constructed. It is only when something goes wrong that, in the vast majority of cases, the plumbing apparatus receives a thought; and then it is looked upon as an outrage and robbery that something has to be done and money spent. Great pressures are constantly at work day and night, year in, and year out, trying with varying force to tear it apart; expansion and contraction from varying temperatures is always at work to break it; in our climate the cold never fails to get in deadly work, when the slightest opportunity is afforded it; added to all this, is a carelessness on the part of the users that you would scarcely credit. Is it any wonder that troubles are frequent? The wonder is rather that there is so little to complain of.

There is a further complicating factor in the difficult problem we are considering and that is a the constant change that is going on. During my time men, methods, and materials have changed completely, and more than once. In the early days of the trade in this city, all soil, waste, and water pipes, were of lead; sewers were constructed of brick or wood; there were only "the pan closet," and "the hopper" and "trough"; sinks were of stone, wood or lead lined; "sewer gas" was unknown; back venting and soil pipe ventilating were unknown quantities. The discovery of the germ theory of disease, and the necessity of guarding our dwellings against the entrance of the disease-producing little microbes, completely revolutionized the old fashioned plumbing methods. To-day iron has almost entirely replaced lead, as a material for soil and [illegible] "the pan"; the same material has largely replaced the the sinks and baths of our fathers; and brass and copper, as well as iron, have largely taken the place of lead for water pipes. And the end is not yet for they are hard at work, experimenting with a view to the introduction of glass, as a material for the conveyance of the water and sewage of our dwellings, and when success is attained, as I have no doubt it will be, we will have an ideal material for the purpose—and present indications are that it will be "made in Germany."

My intention in the foregoing remarks was to fully impress you, if possible, with the importance of the subject we are considering, and to bring as forcibly as possibly to your understanding the difficult and complicated problem offered for solution. Did I go no further you might consider the time so far devoted to the subject as wasted; but there is no intention of wasting your valuable time, and it will be my endeavour to now present for your consideration something practical and useful for at least a partial cure for some of the ills we mutually suffer—as in this matter the architect and plumber, are as completely joined as were the celebrated "Siamese twins," and any attempt at severance of the connection would in all probability be attended with serious, if not fatal results to one or both.

The first factor to be considered in the solution of the problem, from your point of view, is the plan. At the risk of being considered presumptuous, permit me to say a few words, from a practical man's point of view, of this important part of the subject. First, you must attend to the sanitary features of the case; plan for health. You are building dwellings, homes, for rich and poor; places of life, light and enjoyment. The first, the greatest requirement of a dwelling is that it be healthy; honestly built, on healthy site, amidst healthy surroundings. You can not control all the conditions; the site is not yours in the choosing; the surroundings are beyond your power; but your knowledge and skill must be such, as to attain the best possible results from the conditions you have to deal with. If the site is damp, or boggy, or subject to occasional flood, you must plan for not only sub-soil but also surface drainage. Water in itself is one of God's good elements; it is only when it is "matter out of place", that it becomes a menace to life and health. No one dreams of considering the water of the river, lake or ocean, a danger to those residing in its vicinity; we naturally go to the water in the heated summer term, for health; but the undrained swamp, the stagnant pool, the damp cellar and moulded walls, are dangerous to a degree; and no one can have them as neighbours or harbour them in the dwelling without sooner or later paying the penalty imposed by nature for a violation of its laws.

The removal of sub-soil water presents many difficulties; but in our city there should be no trouble, provided you establish the principle of never erecting your buildings at such a level, as to be below the sewers made and provided by the city for sewerage and drainage purposes.

Such a remark may seem unnecessary and uncalled for, but I know that it is done every day. I could name a number of buildings that are periodically flooded because the cellars are either below or too near the level of the city sewers. There must always be a margin of safety. The crown of the street sewer, with an allow- [illegible] know the owner will fight and argue against steps, to business blocks, and insist on a cellar of given depth; but let me assure you that, when the water rises in the cellars and so renders them useless, or goods, are damaged, he forgets all your arguments against going too deep in the ground, and the fact that he insisted upon having things as they are, is no longer in his mind; but he does not forget to talk of the foolishness of the man who built him a useless basement, and the stupidity or worse of the plumber who carried out the plan. If necessary, I could mention a number of cases in point. Of course artificial means of drainage may be employed in certain cases; and, where large plants are installed in charge of skilled men, such means may safely be adopted; but outside of this, for the ordinary shop or dwelling, there is only one safe plan, and that is to so construct your building that the natural drainage will always be available. In planning for the erection of buildings on low and swampy sites, provide for a system of sub-soil drains so laid that they may easily and safely discharge the sub-soil water into the existing sewers; taking care that they be properly trapped at their junction with the main sewer; and further taking care that, during the dry seasons, these traps are supplied with water enough to keep them safely sealed against the entrance of air from the sewers. This is

best done by connecting the waste from some convenient fixture, so that water will always be supplied to the trap. A wash basin or sink, to be used for clean water only, is the best; as the use of a W.C. or Kitchen Sink will likely result in the choking of the trap and consequent filling of the sub-soil drains with grease or sewage, or a special pipe can be run, from which water is allowed to drip. Cellular gutter land tiles are very good for sub-soil drains provided they are not laid in running sand. If unfortunately your building rests on such poor material, I know of no form of open drains that will not fill up. In such case the sinking of a pit, with an outlet at the proper height, with the usual precautions against its filling with sand, is perhaps the best method of procedure; but great care must be taken to prevent the sand running into the drains, if you wish the building to stand erect. I know of one large building in this city the front of which nearly came down, owing to the fact that a leaky water pipe, near the foundation, washed the sand away into an open drain in the vicinity.

Next, as to the sewers, or those pipes that are to carry off the liquid wastes of the building; as distinguished from the drains, which are for the conveyance of sub-soil, or surface water. They must be of extra heavy cast iron pipe inside the building, as called for by the civic by-law, and should, when at all possible, be so arranged as to be at all times above the floors; or, failing this, at every change of direction fit a cleaning eye that will permit of the insertion of a cleaning rod, from point to point and out into the main sewer. I know of no better material for outside drains than properly laid tile pipes, and no worse material for the inside pipes, especially if they have to be laid under ground, as to make them tight they must be thoroughly cemented at the joints. This makes them into a long and continuous length of very brittle material, sure to be broken by the slightest subsidence of the ground or building, and even by the use of the building. The handling of heavy goods in a warehouse, or even certain legitmate acts in a dwelling, are enough to cause sufficient jar to break these pipes.

Avoid too large pipes, try to plan your sewers so that the amount of water flowing through them will scour or flush them. Remember that the largest flush pipe from an ordinary closet is only 4 in.; and that, as a rule, [illegible] the water in a solid stream but it is [illegible] basin. A pail of water rapidly [illegible] the amount of water discharged into house fixtures at once. Of course when roof water is discharged into the sewers through the house pipes a large flush will be the result at times, when heavy rain falls occur; but it is very seldom that the ordinary roof of a dwelling will flood a 4" pipe; even if running full at the inlet. The friction and resistance as it travels through the pipe, reduces it in volume. Many architects plan to increase the size of the pipes according to the number of the fixtures to be discharged into them. While this plan has some merit, be careful not carry it too far. Remember that if there were a dozen closets on one pipe, and the greatest care was taken to have them all discharge at the same moment, that it would be impossible to so arrange them in ordinary practice, that the discharge from all of them would reach the main soil pipe or drain at the same moment; and that the water reaching the main stack first, can never be overtaken by that which follows it. My experience is that more trouble has occurred by the filling up of drains and sewers that were too large to be properly scoured, than by the blocking of small drains that are fully flushed. The same remarks apply to the waste pipes. It is quite common to find 2" pipes called for from wash basins, and baths, whereas the average bath and basin plug will not allow sufficient water to pass to fully flush an 1½" pipe.

Carry your pipes direct as possible. This can generally be done with very few bends and offsets, if provision is made at the proper time in the stone, brick and woodwork; but when bends have to be provided, at every flat, on account of the variation of thickness of walls, or because beams have been put in the way, or the roof outlet is at an inconvenient point, you have a needless complication making for trouble. While nothing is planned for the reception and passage of pipes, the positions of the fixtures are indicated; but the work of other trades may render it an exceedingly difficult matter for the plumber to get his pipes to the positions without doing a lot of damage that could be easily avoided were provisions made at the proper time. Shew on your plans, embody in your specifications, the necessary instructions to carpenter and mason. The pipes large and small are as necessary a part of the modern building, as the doors and windows—then why not provide for them.

[illegible] to have the fixtures where the sunlight will get to them. Remember light is the great life giving agent, and that all plumbing fixtures are of necessity more or less foul. Let the light shine on them; the sunlight, if you want them to be clean and kept clean. Treat the plumbing as an important part of the building; don't treat it as something to be put in any dark hole or corner, where you can put nothing else. Have a dark parlour if you please, it is most used at night, when [illegible] will disper the gloom and make it nice and inviting; but have the bathrooms light; the sinks, basins and tubs near the windows.

If you wish to avoid trouble concentrate the work—try to place the fixtures so that an accidental overflow or burst will not damage the hall or parlour ceiling. The less the pipes are scattered about the less will be the first cost [illegible] will be the least [illegible] of trouble, in the future care and maintenance of them. [illegible] different [illegible] one over the other; it may in some cases mar the artistic effects, but it won't damage the ceilings and walls so much, in case of the inevitable flood.

Have every part of the plumbing fixtures easily accessible. When possible run pipes in back passages and through pantries and such rooms and leave them exposed. Where they must be concealed, have this done by some means that will allow the pipes to be quickly exposed. Hooks and buttons are best; screws are a nuisance, their taking out is sure to cause damage to decorations and paints. Never put pipes behind fixed columns, or plaster them in, as the day will surely come when they will require some attention; then trouble begins, and reputations are wrecked with the ceilings and walls.

Select simple fixtures. A closet with a complicated system of valves, levers, syphons and overflows, may work perfectly when new, but is sure sooner or later to

get out of order. A single seat is better than one with a cover, which is a survival of the old style boxed in W.C. The cover is a complication that serves no useful purpose. A W.C. is a W.C. and if there is anything in it that requires to be covered, there is something wrong. Have it so arranged that it is impossible to cover up any filth or foul matter. Basins with the plain old fashioned plug, are the best. Those with a complicated system of recesses, stand pipes, and valves, are to be avoided; they get out of order, and when in order the parts are not accessible, and so get foul and malodorous. The same remarks apply to baths and sinks. As to traps there is nothing to equal the **S** or half **S**, or **P** trap. The traps of a complicated form, such as are in common use, have not a proper scour, and are never clean. The merit claimed for them is that they are non-syphonable, which is open to question. If they are so, it is because they obstruct the rapid flow of water. Syphonage can best be prevented by a proper system of back venting; and even this can be carried to an excess, and often is. I have in mind a house where all the traps are back vented with long lines of pipes, of the sizes of the traps, but with unavoidable twists and turns, that render them inoperative, and their fitting was simply a waste of money. Venting traps in a basement, with long lines of pipes carried up in walls through the house to the roof, is not good plumbing—although at first thought it may seem so. This is where that uncommon commodity, common sense, comes in. The risk of danger from a syphoned trap is far less than the risk incurred by the getting out of order of long lines of concealed vent pipes. Fortunately the average water cock, is seldom perfectly tight; they all drip a little and this drip is enough to reseal in a few minutes a trap deprived of its seal by syphonage. Do not for a moment [illegible] I am advocating the running of any risk of danger from emptied traps; what I desire to impress upon you, is that there is risk of overdoing the trap venting part of a plant, as well as of incurring needless cost. "Simplicity thou art a jewel" would be a good motto for the architect and plumber to have constantly in mind [illegible] While on the matter of sewer [illegible] may not be out of place to say we have not got a really first-class joint for iron pipes. The lead joint is not to be depended [illegible] ties between it and the iron, the lead is sure to work loose. The really permanent part of the ordinary caulked joint is the oakum. When proper oakum is used and it is thoroughly caulked, it forms a safe material against any serious leakage of sewer air; the lead holding it in place. It has been my practice for years to put a substantial covering of putty on top of the lead while it is hot, as an additional safe guard. The best joint I know of is made of red lead and oakum. This makes a permaneotly tight joint, with sufficient elasticity in it to allow for the slight difference in size of ordinary pipes, arising from the various changes of temperature; but it is so filthy to handle that it is unsuitable for general use in house work. Portland cement and oakum also makes an excellent and durable joint. The difficulty with it is the fact that workmen cannot be depended upon, in general practice, to take proper care in mixing the cement; and you have to depend upon the workman, after all is said and done, as you cannot be on hand all the time to watch the various details of a complicated practice

The introduction of wrought iron pipe, with the ordinary screw joints, has much to recommend it, but there is as yet unsolved the question of durability*. If the gases and fluids of the sewers attack and destroy a material possessing so great a resistance to such forces as lead and cast iron, it can hardly be expected that so susceptible a material as wrought iron or steel would be permanent. The introducers of this system, evidently appreciating this fact, claim to cover their pipes with some resisting material; but the coating is of necessity so thin as to not be worth the cost of its application. The pipes are thick and no doubt last many years, but there is nothing like cast iron. Speaking of coating pipes, permit me to say that the so called asphalting should be omitted; in fact in some towns the plumbing by-laws expressly forbid the use of coated pipe. In Montreal it is so now. The coating at the best is so thin as to be of very little practical use, but it suffices to cover defects. Many a length of pipe has gone into use that, were it not for the coating covering its defects, would never have left the foundry. You cannot see blow holes, cold shuts and similar defects, when covered with a coat of black varnish or tar—politely called asphalt.

Have all pipes that serve as main stacks carried full size through the roof. Omit the intercepting trap; there must be no interception of sewage. Once it leaves the fixture, the quicker it reaches the end of its journey (the main sewer) the better. The basic principal of the water carriage system which we use is the rapid removal of solid and liquid sewage matter from the premises by means of an adequate amount of water, and any checking of this is defeating the very object, desired to be obtained. Too much stress has been laid by "faddists" upon the danger of [illegible] getting into the house from the main sewers. Gentlemen, there is no such thing as sewer gas; at least so far the scientific world has not been able to find it. Sewer air there certainly is; that is the ordinary air, loaded with the odours of decaying animal and vegetable matter; but the main sewers are all [illegible] into our streets and [illegible] get the air of our houses, we cannot get it anywhere else in the city. Take no chances of the sewer air [illegible] ; but trying to bottle it up, and in so doing obstructing the flow of sewage in the pipes, is not the correct way of doing it.

Water-pipes are in general practice made of lead. An excellent material it is for water pipes when it is pure lead, and years ago there was no thought of seeking a better; but of late years so much argentiferous lead (a by product of the silver mines) has been put upon the market that the old "stand by" has lost its character. Pure lead is soft and pliable; the argentiferous lead is hard and brittle and liable to crack and leak. Especially is this the case when it is used for the conveyance or circulation of hot water. Many substitutes have been introduced. Plain iron pipe is apt to rust out in a few years. Galvanized iron has been extensively used of late. Whether the very thin coating of zinc with which it is covered, is an ample protection, time alone will tell, and it is a question whether the inside of the pipe is thoroughly coated. Judging from the experience with galvanized iron

*Since this was written I learn they are trying to pull them out in New York because of corrosion.

range boilers in this city, it is a most unsuitable material that will soon give trouble; and from a sanitary point the contact of water with zinc is very undesirable. Glass lined iron pipe has also been introduced in this city, and one would suppose it was an ideal material for the purpose; but I have had to remove it from one row of houses, asfor some reason, probably the difference in the expansive qualities of the two materials, the glass after a few years began to break up, and it was no uncommon thing to draw broken glass from the taps. On the removal, and upending of the pipes in question, small particles of glass would come out in quantity. Tin lined iron and lead pipes have also been tried, the difficulty with the tin lined lead pipe being that, in making the joints, the low melting point of the tin caused it to run and made trouble; besides it was expensive. I have here a sample of lead lined iron pipe. It looks all right and combines the durability of the lead, with the strength of the iron. At the moment I know nothing against it but it doubtless has its weak point, probably the joint. The difficulty with all combined materials is the unequal expansion and contraction and in some cases galvanic action is set up, that rapidly destroys the material. Taking it all in all, there is nothing better than honest lead pipe for the conveyance of cold water; and copper pipes—iron pipe size, not thin copper pipe, such as I have shown you—for the hot water system. The samples of copper pipe I show plainly the effects of both galvanic action and the unequal expansion and contraction between the copper and the solder of which the joints were made. These samples were taken from a house on which no expense was spared in the fitting of the plumbing; and, while the pipes did good service for a long time, in the end damaged ceilings much worry and expense were caused by their use, and they had to come out.

The [illegible] large and important a one for me to take up at this time; but a few words on the heating apparatus will not be out of place. While the modern low pressure steam plant is doubtless the best for some buildings, our Canadian experience so far is that nothing can come up to the modern [illegible] for ordinary [illegible] And here let me say that this form of apparatus had its origin in our city; and in no other [illegible] demands of our people in this respect approach the unreasonable—that 70° should be demanded in sleeping apartments, with a 20 below zero temperature outside, is going beyond reason, besides being exceedingly unhealthy. Imagine sleeping in an apartment at 70°, and stepping out in the morning, at say 25 below zero. The wonder is that our people do not suffer more from throat and lung troubles than they do. Permit me to remark that there never has been a temperature of 30° below zero in Montreal, as far as I have been able to find out. Once, a year or two ago, it went to 26° below. That is I believe as cold as any authentic record we have for our city proper. Yet some specifications call for 70° wheo the thermonetor is 30° below.

I will now tell you the whole secret of having a warm house. There is no other way of getting it in our climate and I want you to keep it constantly in mind. It is to build it warm. No furnace, boiler, stove or other means of supplying artificial heat is sufficient to counteract all the cold of out of doors; and that is what is being attempted when the house is constructed in such a manner as to let in the cold. Honestly built walls of proper thickness, with the joints filled with mortar, not merely jointed outside to look well, are indispensible. Then, no matter how thick these walls are, or how solidly they are built, there must be an air space between them and the inside plaster. This air space must contain confined air, for if the air can circulate behind the plaster, you have a perfect cooling apparatus; in fact it is on this very principal of moving; air that refrigerators are built; but confined air is a good non conducter and protection against cold. A solid wall that is plastered on the inside, or even lined with porons bricks, will not keep out the cold. It cost me several hundred dollars to find the latter out, but you can have the benefit of my experience for nothing. The walls should be back plastered between the furring, carrying the coating of plaster well up, and down, between beams; and the furring must be stopped of at the top to prevent the circulation of air. Then door and window frames must be cemented into position tightly with oakum. Stuffing material around them that looks like chopped straw or dried grass, lightly pushed in with a screw driver, as I have seen it done dozens of times, is not caulking in the frames with oakum. The object to be attained is to keep out the cold; and, if you let it in around door and window frames in ever so small quantities it gets behind your inch of plaster, and, instead of having solid walls between your house and the outer cold, you have only the thickness of plaster. If the air behind the plaster can circulate as fast as it becomes heated, it moves off to be replaced by a fresh supply of air from out of doors. The door entrances to buildings are another weak spot. In the cource of [illegible] the [illegible] beam which gets knocked away. The mason has gone, "Mr. Carpenter" lays his floors, sets up his steps, builds the gallery; and there openings are left; invisible but getting in their work of letting in the cold; and the house dwellers wonder why the floors and walls are so cold, and why there are [illegible] curses the [illegible] the furnace man; and coal dealer, because of the size of his coal bill; wonders why "Jones" heats his house [illegible] "Jones" is heating his house and his neighbour is trying to heat all out of doors—a big contract in our climate. Another weak spot, a very weak spot; of comparatively recent origin, is the ventilated roof. It is right to ventilate the roof, but, when you let the outer air in below the roof, remember you must keep it from entering the house. A one inch rough board and a thickness of building paper is not proper construction for our winter; and hundreds of our houses are so constucted. I could give you many instances of this if necessary, I know of two first class houses where a few bags of sawdust, put on top of the boards in the attic space, made all the difference between a warm and comfortable house and a cold and uncomfortable one; and the unkindness of it was that I had to supply the sawdust and labour because I was so unfortunate as to have fitted a furnace in these houses. Sawdust is not a proper material for the purpose, but you must have something to keep out the cold. Mineral wool is a better material.

Gallery beams projecting through the walls are another source of trouble. The mortar dries around them and the cold pours in just where it will do most harm. Caulk them in tight with oakum if you want the house warm. You will be told they are well bedded. They may be; but timbers when wet with mortar swell, and when dried by heat shrink; and the air enters. You must remember that when the air is cold outside and warm in, there is a very considerable difference in pressure; and the cold air is seeking entrance by every crack, cranny and pore. It is possible to blow out a candle through 1' 0" thick of sandstone, and ordinary brick and mortar is much more porous. Keep out the cold by taking the proper common sense precautions at the time the building is being constructed; it cannot be effectually done afterwards; and you will have a warm house, small coal bills, contented clients, possibilities of ventilation, and a good reputation. As to percentages of piping; years ago we never thought of using over 6% on the ground floor, 5% on the first floor, 4% on the third floor; but your modern building is cold with 10%, 8%, 7%. Why? Simply because the same precautions are not taken keeping out the cold as were taken in the older buildings.

I have one request to make, as a matter of simple justice to your heating contractors; that is, do not put in a blanket clause in your specifications, that puts the plumber at the mercy of an unjust and unreasonable client for the balance of his life. Plan your house, specify what you want in the way of heating apparatus, and see you get it; then, instead of running off with a clause that the building is to be heated to a given degree in coldest weather, say: "If the proprietor, after a season's trial, desires additional power or heating surface, the contractor shall be bound to supply the same at contract rates. This is perfectly fair to all but the heating contractor, as he cannot go to a finished apparatus and add to it except at a greater cost than the original work. But he will not object to this [illegible] unfair and unjust to a degree. Imagine my having to put additional radiators, for nothing, in a room that had been occupied for 5 years as a bedroom and was then converted into a sitting room; and imagine further any architect, calling himself an honest man and a gentleman, backing up such a claim. That it was not necessary was proved by the fact that, when a year after the additional heating was done, the house changed hands, the next tenant had the pipes taken out, because the room was too hot. Of course there was a cranky woman in the first case.

I must now touch upon a somewhat delicate subject, but it is the most important of all the subjects we have had under consideration. Something has been said about selection of materials and methods to be pursued in their use; but the most important selection you have to make, for your own sake—and the sake of your clients, is *the man*. The best is none too good. Dont let the continued cry for cheapness influence you. Your reputation you cannot afford to cheapen; and every time you let a contract, you put your reputation into the hands of the man you let it to. You cannot watch him all the time; and if he wants watching you have no use for him. None of us can be in two places at the same time, and while you are in your office—or even in your bed—the skin contractor may be wrecking your character. Beware of the man who is always telling you how good a job he is making for you; who is always at the building to point out his good work, and the mistakes the other fellow is making. "Good wine needs no bush." Try to select men who have some character as well as skill and means to put into their work. Beware of the cheap man.

Tenders will of course vary within a reasonable limit; but when some one is away down look carefully into the matter. No one gives a dollar for ninety cents. There is no necessity for so doing, the dollar is always worth a huudred cents. If a man says he is doing it, he is either a knave or a fool; and you cannot for a moment leave your reputation in the hands of such a man. If he is really giving you a dollar for ninety cents he is a fool; and not carrying out legitimate business principles. If he is only pretending to do it, he is a knave, and as honest men you have no use for him. Experience will teach you, that as a rule things in this world are worth what they cost. A cheap man or a cheap house, or a cheap architect is cheap because there is something lacking. Of course, the special cases and exceptions come in; and in the hurry of tendering, especially under some of the conditions that I am sorry to say exist, it is very easy for a contractor to make a mistake and "leave the roof off" as the saying is. In such a case it is far better to consult over the matter, and allow a man to withdraw. Do not allow him to amend his tender; that would not be just to his competitors, but you can allow him to drop out. Otherwise when, he finds out, as he surely will, that he has made, a mistake, the temptation to try and make up his loss, will be very great; and we are all human. When you have proved your men, trust them, they will take care of your reputation for you, if they find you are careful of them. It is their interest to do so; and, after all is said and done, self interest is the most powerful factor in all business matters. As a rule men do not become philanthropic until they have [illegible]

[illegible] point is that in some so far as I know unaccountable way a man's personality and character gets into his work. Take two artists trained in the same school. One takes a canvas, stretches it, applies his colours, result, a painting worth fifty thousand dollars. His confrère, using the same materials and having the same training and desire, produces a picture that would be dear at fifty dollars. The training is the same the materials alike; the difference is in the mental equipment, the personality, the character. If you want Smith's architecture you cannot by any possibility get it from Jones, although Jones may agree to give it to you. It is the same with grosser materials. A friend of mine whom I congratulated upon having built himself a fine residence, said "yes, I am satisfied with everything but the woodwork; the carpentering does not come up to my expectations." I replied, "you have good woodwork, your carpenter is a good man and certainly did his best." "Yes," he replied, "that is so, but Johnston's carpenter work was what I was to have had." "But Johnston did not do the work," was my reply. "Oh," he said, "but Johnston's work was to have been the standard." When I told him that only Johnston in the whole world could give him Johnston's work, he paused a moment. then said, "you are right. It never occurred to me before. I engaged the wrong man."

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

A "Subscriber" writes: Could you inform me through the columns of the ARCHITECT & BUILDER as to whether it is possible to get a uniform color to a Portland cement, trowel-finished piece of work, such, for instance, as a dado for bathroom, kitchen, etc. I have to confess to the present time my inability to do it, and I have never yet seen any that has been uniform all through.

ANS.—Some of the most experienced and skilful plasterers state that, while they can get a perfect finish, they have failed to secure uniformity of color, and they do not think that a uniform color can be obtained.

From "Winnipeg": Will you please inform me which is the more economical, heating by steam or by hot-water. Also please state what about radiating surface would be necessary to heat up a large room to 60 degrees when the mercury is freezing point outside? Any information will oblige.

ANS.—The condition and the efficacy of the boiler cause one method of heating to be more economical than the other; but speaking generally, the two methods are about equal in the heat afforded for the fuel consumed. If the fuel has, say 10,000 heat units to the pound, then the customary proportion of these units should be delivered from the radiating surface as well with steam as with hot water; but, as stated, the local conditions have always to be considered. The area of steam-heated surface to afford given results is usually six-tenths of that allowed with hot water; thus, 15 square feet of surface is a common average allowance per 1,000 cubit feet of space to afford 60 degrees where it is freezing outside, with hot water, while 9 square feet is allowed with low-pressure steam (1lb).

From [illegible] there some method of fixing paints or stains with water or milk that will stand the weather fairly well? I am in want of such a water paint or wash that is cheap durable.

ANS.—Some years ago the United States Goverment had a formula for a cheap water paint that was used or the outside of light-houses and which seemed to stand, fairly well. To prepare it, one-half bushel of line is slacked with boiling water, and kept covered during the slacking to retain the steam. When cold it is strained-through an ordinary sieve or paint strainer and then one peck of salt, dissolved in warm water, three pounds of rice flour stirred in water and boiled to a thin paste, one pound spanish whiting and one pound pale glue dissolved in water, added to the strained lime mixture, thoroughly stirred and allowed to stand, well covered, for several days before using. This wash must be warmed in a kettle before using and applied with wall brushes as hot as it can be done without injuring the bristles. Such a paint wears well on wood, brick or stone. If a buff tint is desired, French ochre, ground dry, may be used as a coloring, and if reddish tone is desired, Venetian red should be used. A reddish buff is obtained by a combination of ochre and Venetian Red. Chrome yellow should not be used, since this pigment is affected by lime.

A red wash can be made by mixing dry Venetian red, to which whiting or quicklime is added, with skimmed milk. The addition of half a gallon of linseed oil to each gallon of this wash will render it waterproof, but even without the oil it will stand for years.

In 1879 the New York *Evening Post* published three formulae for paints or washes, made up chiefly from lime or cement and skimmed milk. A very large class of water paints for outside use are made and sold to-day, and answer the purpose of cheap weather resisting paints very well indeed, that are dependent for their binding properties upon a product of this same skimmed milk-casein. Such paints dry with practically no gloss, and when dry, a second coat of paint can be applied the same as with any other paint. These casein paints are generally known to the trade as water paints, or alabastine. They are useful for all sorts of outbuildings, for painting brick walls and especially for the interior of factories, warehouses and sheds. While they cannot be said to be weatherproof, they will stand considerable exposure to the weather, and on old weatherbeaten woodwork may be used as a priming under an oil paint, provided the very best results are not looked for.

Still another class of water paints have been long extensively sold in England, and are to some extent sold in this country. These are put up in paste form, the same as ordinary oil paints, and require thinning with water to reduce them to working consistency. They depend upon silicate of soda or water glass as the binding agent. These paints have given good satisfaction wherever used, especially on brickwork, but are more expensive than the casein paints and hence have not come into such general use.

From "Workman":—How can I "Lay out" a circular top head for a window having parallel jambs, set in a circular wall?

ANS.—This is [illegible] young workman, but in the study of the subject soon convinces the operator that the solution is not so difficult as at first supposed. Let A in Fig. 1 represent

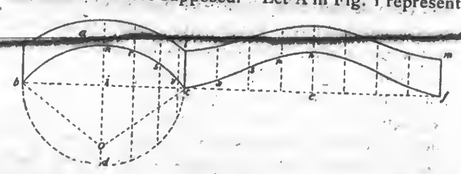


FIG. 1.

the plan, which is drawn from the centre O. With a radius equal to half the opening draw the semi-circle b d c, and lay off the quadrant c d into any number of equal parts. From these divisions erect vertical lines to the outside of the wall plan, and upon the extended horizontal line, from c to e, place these verticals at the same intervals as the divisions of the quadrant, and make the points n r s v the same height in the development, and a curve traced through them will show the concave edge of the soffit, while the curve traced through the ends of the verticals will give the convex edge. That part from c to f is found in the same manner, being merely a repetition of the first half.

Straight wood may be left on each end for the purpose of securing the head to the pulley style or jamb, and if the circle of the head is not very large, the soffit should be made of two or more laminations and glued together on a form the same shape as the head of the opening, in this case a semi-circle.

Fig. 2. shows a more complicated operation, and illustrates the laying out of the head casing for the concave or inside of the circle top frame in a circular wall.

Here I have used the same plan as before with the result that the casings at o o are twisted out of correspondence with the drawing, however, this does not prevent their fitting the wall if correctly made

After laying off the wall plan, draw a horizontal line any distance above it, and with a centre, i on this line, describe the semi-circle casing as it would appear for a straight wall. Divide this into any number of equal parts, the same as in Fig. 1. and drop vertical lines through the wall plan to the corresponding points on the concave side as shown at 1, 2, 3, 4,. Below the

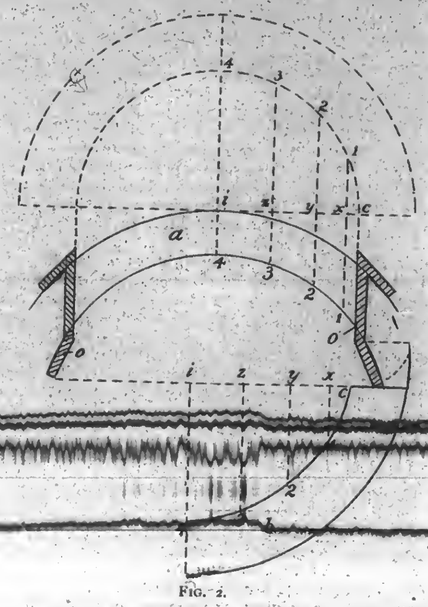


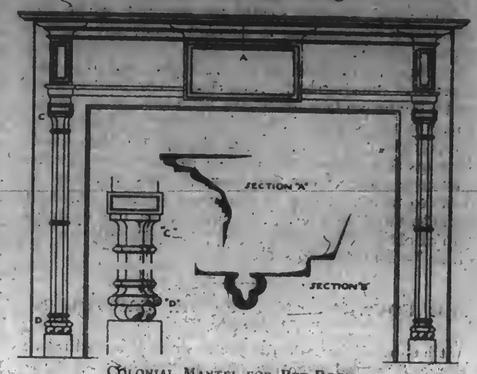
FIG. 2.

wall plan draw another horizontal line of any convenient length, and upon this set off the distances found at 1, 2, 3, 4, on the wall plan, and which are marked X, Y, Z, 1. From points just named drop verticals equal to and correspondent with the distances found in the quadrant in the upper part of the figure, and through the ends of these trace the line c 1, 2, 3, 4. This edge may be sawed out and the other side gaged from the first.

The reason for this operation is that the real width of the opening to be covered by the casing is shown at o 4 on the wall plan, and must be incorporated with the proper height and curvature which is accomplished in the pattern b.

From "Builder":—Will you kindly publish a sketch of a colonial mantel suited for a bed-room finished in colonial style and enameled in flat white?

ANS.—We reproduce herewith a design for a mantel



COLONIAL MANTEL FOR BED-ROOM.

which we think will be appropriate. Some details are shown which may prove useful to "Builder."

WRECKING BUILDINGS.

It is only within comparatively few years that the business of wrecking buildings has grown to large proportions in this country. Until recently old buildings were shored up, repaired, remodeled and made to continue in service. Now the rule is reversed and many structures that cost a large sum of money and are still well adapted to discharge the duties for which they were constructed are being torn down and replaced by others, many of which in their time, and a short time in frequent instances, will follow their predecessors to the junk yard.

The wrecking of buildings has now become a well-defined business, in the prosecution of which a great deal of capital and large numbers of men are employed. The business is at once useful and lucrative. A large amount of material, nearly all of which is valuable and much of which can be employed in other buildings, is recovered, while contracts are made on a basis insuring large profits to the skillful and well equipped wrecker. For these reasons, coupled with the fact that the field [illegible] companies ought to be able [illegible] great safety as they are constructed.

This does not seem to be the case. The demolition of the Chicago court house, which has been but a short time under way, has already resulted in the loss of two lives and the serious injury of several men. While nothing in the way of reflection upon the contracting concern is intended, it seems proper to call attention to the circumstance that better modes and closer supervision of such work may be secured, not only in the present instance, but throughout the country at large, since the present instance is by no means an isolated one. So serious were the Chicago catastrophies that the city authorities ordered work on the structure to be discontinued until greater precaution against accidents could be provided.

The wrecking of buildings is a distinct business in itself, depending on different conditions and principles than those that control in construction undertakings. The theory seems to have been quite generally adopted that while it takes the highest skill to build, properly and safely, any sort of labor is good enough to tear down. This idea should be dispelled, and that once for all. The profits of wreckers are sufficiently liberal to justify the employment by them of skilled labor and the use of the best appliances and machinery, not only now produced, but that ingenuity can devise and scientific workmanship construct. The business of wrecking buildings ought to be safeguarded, and that in every direction, quite as much as is that of construction, and these latest accidents, following hard on

others that have preceded them, should have the effect of producing more stringent regulations.

The chief trouble seems to be that when the demolition of a building is decided upon, the owners are in a great hurry to have the work accomplished, the time enters, and that most seriously, into the very essence of the contract. As a rule a time limit is fixed and a bonus paid for every day by which it is anticipated by the wrecker, who is assessed a certain sum for every day that is employed beyond the day fixed. Perhaps this is the only way to properly protect the parties to the contract, but, none the less certainly, it leads to haste, which is the most fruitful cause of accident and disaster. All things, even the destruction of old buildings, should be "done decently and in order."—*The American Contractor.*

THE FOUNDATIONS OF THE CAPITOL AT ALBANY.

It has now been several years since the Capitol at Albany attracted attention save as the centre of legislative wisdom of the Empire State, but it has at last emerged from its placid condition of apparent security to resume its previous rôle of a structural nightmare. After sinking about $25,000,000 in this building the taxpayers of New York might be warranted in hoping that it was at last completed and fit for occupation for all time, but this expectation has been rudely crushed by recent events. It has been necessary to close the monumental stairway leading up from State Street to the portion of the building reserved mainly for the Assembly. Just what has happened to the building is kept a secret by the authorities, but experienced engineers have made an examination which is said to indicate that some movement of the foundations has thrown such heavy loads on a part of the masonry as to subject it to danger of crushing. It is unfortunate that this has happened at the Assembly end of the building, for, coming after the notorious trouble with the ceiling of the Assembly chamber, the masonry of which has been replaced by papier maché in order to reduce the loads on the walls and piers, it may be thought that this branch of the Legislature is forever condemned to transact business under a sword of Damocles.

The staircase has been the source of considerable trouble in the past, and extensive repairs to it were executed about eighteen years ago. Evidently these were not adequate, however, and if the present authorities are able to do so they should [illegible] petent engineering commission to make a thorough examination of the building. Mr. Edward P. North, M. Am. Soc. C.E., makes the following comment on the conditions, which indicates how necessary such an examination is: "The difficulty with the Capitol is that it is founded on blue clay, which is without support toward the east. The result is that the clay is fluid under the weight of the building." He adds the further comment that piers carried down to bed rock will prevent the settlement or movement. Anybody who has had any experience in trying to keep heavy buildings in place on a sloping mass of clay will not need to be told that trouble will follow weighting such material if it is free to move sideways. A large structure for manufacturing purposes on the Hudson not far south of Albany has shown a tendency toward extensive travels from this cause, while the trouble in Cincinnati and Cleveland in keeping buildings in place on a mass of unconfined clay is well known. Some important structures in the former city have been giving much trouble lately on account of sliding material under their footings, while the difficulty experienced by the railways along the water front in Cleveland was shown in a number of illustrations printed in this journal a couple of years ago.

As a preliminary step, absolutely essential to the satisfactory solution of the Capitol difficulties, a thorough examination must be made of the materials underlying the building. This must show the slope of the bedrock and the thickness and character of every stratum above it. A thin streak of water-bearing sand below a mass of clay may cause all manner of trouble, yet its location may be difficult to detect. Such an examination will cost considerable money, yet if it is not appropriated the legislators may bring down on their heads many tons of hard and heavy masonry, in addition to the severe criticisms of their constituents.

Until very recently the problem of building foundations on clay was frequently solved with a considerable reliance on Providence as a part of the factor of stability which entered into the design. Buildings were erected on clay which was known to rest on water-bearing sand or gravel, because the expense of carrying down deep concrete foundations to the bed rock was very great. Timber piling could not be used in most of these cases because it would be above the water level and was sure to decay in a short time. The only other method of going down to bed rock was by concrete piers put in by means of wells or caissons. More recently, however, the relatively simple concrete pile has come into use and seems to solve such foundation problems in a rational and inexpensive manner.

In constructing foundations in this manner it is important to observe that the concrete piling can be given much higher unit loads than timber piling. Owing to the imperfections of timber piling when driven to refusal, except under careful supervision, engineers have been forced to adopt unit loads which are necessarily low. On the other hand, a well-made concete pile sunk to bed rock or good substantial gravel is, for all practical purposes, a well-braced column capable of carrying considerably higher loads than a timber pile. The material through which it is driven braces it against lateral distortion, provided this material is itself not likely to move. It is manifest that if a large part of the weight of a building is carried down to bed rock by such piles the remaining weight may be carried by the concrete footings of the walls, for there are very few soils so poor that it is not safe to load them somewhat. Just what proportion of the load should be assigned to the footings in a case of this sort is a matter of judgment, and it thus becomes evident that even though concrete piling offers a new and important constructional resource to the engineer, the sound judgment of foundation [illegible] necessary as ever for the most economical solution of troublesome problems.—*The Engineering Record.*

On page ix. is an account of a rapid piece of building. Work almost [illegible] the erection of the new hotel for the Annex Company at Atlantic City, N.J., by the National Fire Proofing Company. This is a six storey hotel, containing 250 rooms, extending back from the Boardwalk 425 feet, of a width varying from 50 to 125 feet which, between June 17th and November 1st, was completely constructed and handed over to the owners ready for decoration and furnishing. The *modus operandi* of all quick work of this kind is that of the builder who built the workshop. All work must be carried forward at the same time. Although it sounds a greater feat to build a fireproof building in a short time, this manner of building, which completes the skeleton as a first stage, lends itself particularly to carrying forward different kinds of work at the same time, as may be seen at the Traders Bank Building in Toronto where the plumbers and steamfitters are reaching the top storey along with the steel frame.

The idealist is the bravest man in the world. Ideals are the stars to which we have been advised to attach our cumbersome waggons. We talk commonplacely of tides. The tides are merely the efforts of the sea to reach its ideal, the moon. It never reaches it, to be sure, but it gets further away from its bed for the trying.

P.Q.A.A. ANNUAL MEETING.

The annual meeting of the Province of Quebec Association of Architects was held at the Chateau Frontenac Hotel, Quebec, on Thursday, 25th January. It had originally been the intention to have a banquet in the evening, following the business meeting, but as the funeral of the late Mr. Prefontaine was taking place that day, it was resolved that out of respect to the deceased minister the banquet should be postponed. The whole of the busines was disposed of in the course of morning. Mr. John S. Archibald, President, was in the chair. After the reading and approval of the minutes of the last annual meeting the Secretary's Report of the year's work of the Association, printed copies of which were in the hands of members, was by resolution taken as read and was unanimously adopted without detailed discussion.

The report noticed the following proceedings of the Association and of the Council:

Lectures delivered during the year by A. E. Loignon, on Re-inforced Concrete; and by F.G. Todd, on City Park Systems.

The addition to the Library of 3 vols. of Sturgis' Dictionary of Architecture; 2 vols, "Histoire de l'architecture," by Auguste Choisy; 1 vol. "Heating and Ventilation," by R. C. Carpenter; 1 vol. "Concrete Plain and Re-inforced," by Taylor and Thompson; 1 vol. "Strength of Beams, Floors and Roofs," by F. E. Kidder; 1 vol. "Construction Details," by F. W. Chandler.

MR. ALCIDE CHAUSSÉE,
President Province of Quebec Association of Architects.

The formation of the Sketching Club of the P. Q. A. A. to (a) hold competitions in design; (b) meet to read papers and discuss professional subjects; (c) to measure old work; (d) to visit buildings in course of construction. These functions have been carried on during the past year.

The publication for the first time of the annual Proceedings of the Association.

The amendment of the Act of Incorporation so as to remove difficulty experienced in putting into operation the clauses of the 1898 amendments to the charter respecting the prosecution of persons practising illegally.

Proposed amendments to the Westmount building by-laws.

Efforts to procure amendment of the Association Tariff.

Efforts to obtain recognition for the Association Code of Competitions.

Dealings, (still in progress), with the City Council of Montreal, in the matter of having the building by-laws amended so that blue prints of plans, presented for permits to the building inspector, shall be filed and kept on record at the office of the Building Inspector and that all such plans must be signed by the architect or the owner.

A communication to the City Council about by-law No. 345 "Concerning the erection of buildings on Ontario street"; pointing out that the height of buildings to be erected on that street should be governed by measurement and not by the number of storeys as laid down in the by-law; which communication was followed by a meeting with the Fire & Light Committee, to whom the matter was referred, who agreed that the by-law should be ammended accordingly, and who further resolved to report to Council that future amendments to the building by-laws be first submitted to the Fire & Light Committee and that the Province of Quebec Association of Architects be requested to send a deputation of three members to sit and act along with the Fire & Light Committee in consideration of such amendments.

Examinations held and the admission to practice of two succesful candidates.

The Treasurer's Report which follows was then similarly adopted, Mr. Brown being congratulated on the great reduction that had been made in the subscriptions in arrear.

TREASURER'S REPORT.

RECEIPTS were :—Balance, $1,044.32 ; subscriptions, $1,350 ; students and examination fees, $75 ; registration fees, $125 ; rent of rooms, $80 ; dinner, $73.50 ; exhibition at Quebec, $18 ; scholarship fund, $200 ; interest, $43.47. Total, $3,009.29.

EXPENDITURES were :—Library fund, $75 ; returned to Quebec section, $60 ; rent of rooms including cleaning, $390 ; salary of asst.-secretary, $360 ; typewriting, $25 ; stamps and sundries, $33 ; lighting, $18.38 ; taxes, $18 ; insurance, $24 ; expenses at Quebec re-amendments to charter, $100 ; expenses for dinner, $146.10; examination expenses, $90; furniture, etc., and repairing bookshelves, $160.83 ; printing, $69.50 ; architectural papers, $33.05 ; King's printer, 23.32 ; Quebec Gazette, $5 ; Municipal Gazette, $12 ; Bell Telephone, $1.20 ; refund to student, $3 ; collection on cheques, 75c ; balance in bank, $1,371.16. Total, $3,009.29.

THE ASSETS are :—Furniture and office fittings, $677.04 ; electric lantern, $114.50 ; library, $1,296.33 ; fees due 1904, $30 ; ditto 1905, $110. Total, $2,227.87.

THE LIABILITIES are :—Scholarship fund, $400.

THE LIBRARY ACCOUNT began the year with a balance of $210.17 ; received in cash, $75 ; expended on books, $114.33 ; and has a balance remaining of $170.84.

The Quebec Section of the Association reported a balance to their credit of $262.92, and their report was adopted ; Mr. D. R. Brown making the suggestion that it would be a good thing that the Quebec Section should spend more of their receipts on the purchase of books.

On the call for the discussion of general business, Mr. Jos. Venne rose to suggest that the Association should do more in recognition of those who had rendered distinguished service to the profession. It had been, he said, the intention to confer the honorary membership of the Association upon the late J. W. Hopkins, but that gentleman's death had prevented the [illegible] When old men who had [illegible] the profession retire from practice their connection with the Association drops. Mr. Venne considered it desirable that such members should be eligible as honorary members and that others still practising, but of special eminence and distinction, should likewise be recognised by an honorary membership. It was resolved to recommend the Council to frame a motion to give effect to this suggestion.

The Secretary then read a letter from the Architectural League of America calling attention to its approaching meeting in New York.

A letter was next read from the Secy. of the Royal Inst. of British Architects in regard to the Seventh International Congress of Architects to be held in London in July 1906. It was explained that the Council of the P.Q.A.A. had decided to ask this general meeting to appoint any member a delegate to this congress who was prepared to attend it, and further to appoint some one to be president of the delegation. This was agreed to and, on the motion of Mr. D. R. Brown seconded by Mr. J. P. Ouellet, Mr. Archibald was appointed President of the Province of Quebec Delegation.

On the motion of Mr. D. R. Brown the new Council were recommended to reconsider the method of electing officers and if necessary to prepare amendments to the by-laws accordingly.

Mr. Jos. Venne pointed out an anomaly in the present system whereby the President of the Association, when chosen from Quebec, might nevertheless

not be President of the Quebec Section. In Montreal in such event the Vice-President acted as President. Thus the actual President got no opportunity to preside at any meeting but the annual one.

Mr. Gardiner, seconded by Mr. Jos. Venne, moved that $200 be transferred from the General Fund to the Library Fund for the purchase of books. The motion was carried.

The Secretary, Mr. Vanier, read a letter from a young man who had presented himself for the Preliminary examinations and had failed. He wrote to ask detailed particulars especially as to percentage of marks attained, etc. Mr. Vanier asked the meeting how far they considered it advisable to go into detail in these matters. The President said this was a question on which the Council would be glad to know the general feeling of the Association. The subject gave rise to considerable discussion. Mr. Venne was in favour of giving a certain amount of particulars. Messrs. Baillargé, Berlinguet and Lacroix were opposed to being too free in going into detail in such matters. Mr. J. P. Ouellet wished to move that the meeting approve the position taken up by the Board of Examiners in refusing to supply details; but it was pointed out that the Examiners had never assumed this attitude and the motion was withdrawn. Mr. J. H. Lebon was urgent for the supplying of full information. Mr. Lemay said he thought this was a case for further consideration. There was no unanimity of view, and he felt that there was much that he sympathised with in what opposing arguments demanded; he therefore moved to postpone the consideration of the matter to next general meeting, to which the Council should be asked to report. Mr. Ouellet seconded and the motion was carried.

Mr. J. P. Ouellet then brought forward the amendment to the charter, recommended in the report of the Quebec Section, in regard to graduates of Universities being required to pass the preliminary examinations in freehand and geometrical drawing. The recommendation was referred to Council.

ELECTION OF OFFICERS.

The results of the voting on the candidates for office were as follows: President, Alcide Chaussée, S.N.F., S.C.B., Montreal; 1st vice-president, R. P. Lemay, Quebec; 2nd vice-president, D. R. Brown, Montreal; secretary, J. E. Vanier, Montreal; treasurer, J. R. Gardiner, Montreal; council, Jos. Venne, Montreal; J. P. Ouellet, Quebec; P. E. Nobbs, A.R.I.B.A., Montreal; C. S. Burgess, A.R.I.B.A., Montreal; D. N. Macvicar, Montreal.

Mr. J. S. Archibald as retiring president is also member of Council. Messrs. A. R. Decary and C. Dufort were appointed auditors.

Mr. Archibald thanked the officers of the club for the support they had given him during his term of office and called on Mr. Chaussée to take the chair. Mr. Chaussée from the chair briefly thanked the Association for electing him president and the meeting was then adjourned.

PARKDALE BRANCH C[illegible] TORONTO.—DARLING & PEARSON, ARCHITECTS.
Is constructed of brick with Roman Stone trimmings, giving a very satisfactory appearance.

TENDERS WANTED
A Weekly Journal of advance information and public works.
The recognized medium for advertisements for Tenders.
CANADIAN CONTRACT RECORD
TORONTO.

WOOD FIBRE PLASTER
IMPERIAL PLASTER CO., LIMITED, KING STREET WEST, TORONTO

HARDWOOD FLOORING
End Matched, Bored and Steel Polished.
Special attention given to 3/8 and 7/8 Quarter-cut oak flooring in large or small quantities.
THE SEAMAN KENT CO., LIMITED
160 Bay Street, TORONTO. Factory, MEAFORD, ONT.

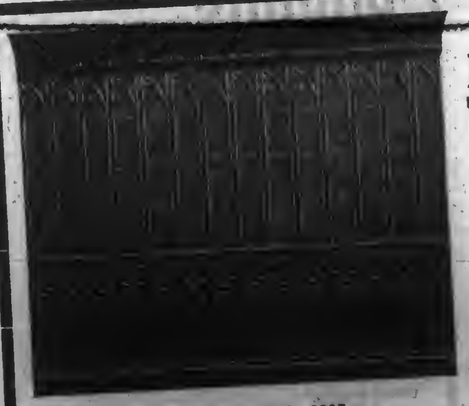
STEARNS
BILLING VISIBLE
TYPEWRITER
Manifold-Gauze Carbon Paper
Royal Paragon Typewriter Ribbons
Cantype Spring Frame Duplicators
Stencil Paper and Inks
CANADIAN TYPEWRITER CO.,
119 St. Francois Xavier Street, MONTREAL
68 Victoria Street, TORONTO

VAULT DOORS AND SAFES
J. & J. TAYLOR Toronto Safe Works TORONTO
Established 1855

TENDERS WANTED
A Weekly Journal of advance information and public works.
The recognized medium for advertisements for Tenders.
CANADIAN CONTRACT RECORD
TORONTO.

DECORATIVE BURLAPS
Oil Coated and Double Sized. In All Standard Colours.
MADE IN WIDTHS OF 30, 36, 45, 54, 72 AND 90 INCHES
ROLLS 30 YARDS LONG.
Architects will profit when making estimates to provide for the use of this Economical and attractive Wall Covering, now used extensively for Dwelling Houses, Halls, Dining Rooms, Hotels, and Public Buildings.
Write For Sample Book and Prices.
MANUFACTURED BY
THE DOMINION OIL CLOTH COMPANY, LIMITED
MONTREAL, QUE.

MILLIONS OF DOLLARS will be made during the next ten years in the manufacture of Concrete Stone and Reinforced Concrete Constructions.—Those who take advantage of the first opportunity are the ones who will reap the great reward.
Being experts in Reinforced Concrete Construction (having had over 25 years experience in Europe,) having also a new improved system of foundations by the Mechanical Compression of the Soil for Concrete Piling, for which patents have been applied for, we want a promoter to float our Company with a working Capital of $250,000.
There is no industry in the country to-day that presents such great possibilities as a revenue earner as this class of work.
APPLY TO
"REINFORCED CONCRETE"
In care of C. H. Mortimer Publishing Company
Confederation Life Building, TORONTO, ONT.



Sidewall Design No. 5087.
Our Classified Designs in
Metal Ceilings
appeal to everyone who wants best values in Wall and Ceiling finish.
For Kitchens, Pantries, Stores, Halls, and many other buildings, they not only add richness of finish, but they are practically everlasting and fire-proof.
We claim both superiority of design and workmanship for our product, and solicit correspondence from Architects and Builders.
Ask For Book of Designs.
The Metal Shingle and Siding Co., Limited
PRESTON ONTARIO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	S. G. CURRY, "
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY	Toronto
JOHN E. BELCHER	Peterborough
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. R. VANIER, "
TREASURER	J. R. GARDINER, "

COUNCIL.

P. C. ODELLET	Montreal.
P. C. NOBBS	Quebec.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.
	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS W. SELF, 1st Vice-President.
C. W. BATT, 2nd Vice-President.
JAS. CRANG, Treasurer.
H. MARTIN.
THOS. CHERITIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD O. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO. WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer, 473 English St.
J. JONES.
CHAS. GOOLD.
T. WRIGHT.
H. STRATFOLD.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BEADEBY
C. P. SHINDLER.
K. M. FRASER
E. G. BAYNE
D. SAULY

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BURGHAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms
Directors: T. G. Latimer, H. Cass, F. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Aird, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Colter, T. A. Giroir.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

N. T. GAGNON, President.
EDWARD M. ROBERTS, Vice-President.
PHILLIP LAREN, Hon. Treasurer.
J. HERBERT LAUER, Secretary.
JAS. SIMPSON AND J. H. HUTCHISON.
JOHN DUTHIE
JOS. O. DESLAURIERS.
JOHN GRAY.
GEO. H. HOOD.
Past Presidents

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN — Chairman
E. W. WHITTINGTON — Secretary
THOS. CATTERALL — Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTOLS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, Jr., 2nd Vice-President.
ALCIDE CHAUS.B. Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new Pullman with all latest innovations for travel comfort, leaves Chicago 10.05 P. M. daily, arrives Los Angeles 4.45 P. M. third day via Chicago, Union Pacific & North-Western Line and the Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to the general agent or address, B. H. Bennett, 2 East King Street, Toronto, Ont.

The Don Valley Brick Works

Manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
W. A. LANGTON - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—NO. 220. MARCH, 1906.

ILLUSTRATIONS ON SHEETS.

Views illustrating Prof. Nobb's paper on European Official Architecture.
Canandian Architect and Builder Competitions for a House of small cost in a Country Town. Designs awarded First and Second Prizes.
Dining Room Fireplace at the Nook, Bermingham.—Messrs. Crouch and Butler, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Studio Club Toronto, Sketch for Village Cross, Awarded First Mention, by Mr. W. B. Van Egmond.
Sketches in Old Quebec, by Mr. G. Roxburgh Smith, Montreal.

CONTENTS

Editorial Notes	33	Pauls' Cross	44
Toronto Architectural Studio Club	34	Preparing a Canvas Covered Porch Floor	44
Ontario Society of Artists and Picture Making	35	The Chatham Central Heating Plant	44
Canadian Architect and Builder Competition	36	The Builders' Exchange of Montreal	45
Our Illustrations	37	Selection of Portland Cement to be Used in Concrete Blocks	46-47
The Official Architecture of European Capitals	38-39-40	Personal	ix
Montreal Notes	41	School for Clay Workers	xi
The Sketch Club of the P.Q.A.A.	42	Production of Cement in Canada	xii
Glass Sand	42		xiv
Intercommunication	43		

REMOVAL NOTICE.

The Montreal offices of this paper will, on May 1st, be removed from the Alliance Building to Room B 34, Board of Trade Building, St. Sacrament street, where our friends and business acquaintance will always be welcome. The telephone number will remain unchanged, Main 2299.

Granite in Ontario.

Red and grey granite said to be equal to Aberdeen granite have been discovered in the neighbourhood of the village of Bancroft, Hastings, County Ont. There is said to be also a remarkable vein of marble. An expert from Akron, O., (symptomatic of American ownership of the quarry) says that the granite can be delivered in Toronto for $1.25 a cubic foot—less than the same variety of rough block costs at Aberdeen. So they will have granite to burn in Toronto.

Permanent Building Exhibits.

Baltimore and Pittsburg building journals have been commenting in terms of great satisfaction upon permanent exhibitions of building materials which have been established in those cities, by the Baltimore Builders' Exchange and the Pittsburg Builders' Exchange League. Space was taken up at once by exhibitors and it is asserted that dealers and manufacturers are already feeling the benefit of exhibiting their material. An argument in favor of such exhibitions is not necessary; it is only a question of when the condition of the building business justifies their establishment. We commend the matter to the attention of the Montreal and Toronto Builders' Exchanges to decide that point.

A New Light on the Care of Boilers.

At the recent Clayworker's Convention at Hamilton some remarks made by Mr. Wickens upon the practice of putting oil in boilers (to remove scale) has an interesting application in domestic work. Mr. Wickens condemned the practice because experiments indicate that oil on the inner surfaces of a boiler prevent the communication of heat from the fire to the water. For the purpose of testing the matter, he says, the Manchester Steam Users' Association built some experimental boilers. Having first tested the efficiency of a boiler when clean, they emptied it and painted the inside with a thin film of oil. Heat was applied in a mensurable manner by Bunsen burners. They took the temperature of the metal on both sides—the side in contact with the fire and the side in contact with the water. The difference between the two temperatures was 299 degrees, when the thinnest possible coating of oil was applied; and, with a thick coating of oil the difference [illegible] degrees. It oil thus interferes with the conductivity to that extent, what becomes of the advice that is usually given householders as to oiling the inside of their hot water system if they empty it? The trick is supposed to be to introduce a sufficient quantity of oil into the expansion tank and then (having of course checked the supply, if it is automatic) to draw off, from the bottom, all the water in the system. The oil will follow the retreating water and coat the inside of everything with that very thin film which was found so effective to prevent the communication of heat from iron to water. The presumption is that, (to say nothing of doing some work of the same kind in the boiler), it will prove equally effective, upstairs with the radiators, in preventing the communication of heat from water to iron.

English Cathedral Stones in America.

An English journal says that some of the stones which it has been found necessary to remove from the Bell Harry Tower of Canterbury Cathedral, in the course of its reparation, are to be sent to Washington, to be incorporated in the new cathedral there. This is not the first time that old stones from England have added an interest to buildings in America. Some historical connection between the new building and the old has usually given the motive, and adds to the sentiment which the old stone inspires. The town of

Salisbury, in Connecticut, (so named because it was originally settled by a colony from Salisbury in Wiltshire), when its public library was being built, procured from the cathedral yard of the parent town a carved stone, which formed part of a heap of such rejecta there but, in the library, has a place of honour as a central object over the mantel piece in the reading-room; where it is not only in itself a quaint and interesting ornament but serves to associate the little town with the Englishmen who founded it. The window tracery from the church of St. Botolph in Boston, Lincolnshire, which is built into the cloister arcade of Trinity church in Boston, Mass., has the same sort of association attaching to it, intensified by the fact that John Cotton, who came to New England from Boston in 1632, had been, for twenty-one years before he left England, vicar of St. Botolph's. There is a more private example in this country, where a stone, taken from the ruins of an ancient family seat in England, and carved with the ancestral coat of arms, ornaments the entrance porch of the eldest son of the Canadian branch of the family. Here is a good kind of memento collecting.

Over Specifying.

If architects are to use standard specifications, which the hurry of business operations seems to make necessary, it would be at least well to have more than one standard, and to take some initial pains, even at the expense of initial expenditure of time, to get the standards right for the kind of work. Most men, after all, have a practice which does not vary much in the range of subject matter; and buildings of one class by the same designer are as much like one another in the materials of their construction, as are boots of one class by the same maker. Why not have a standard specification, for each class, that will truly express the condition of material and workmanship that are expected for the money and can be insisted upon. To specify clear pine flooring not over three inches wide, and take 6 inches with knots is to [illegible] demoralization that will produce nothing [illegible] work. If there is to be no [illegible] otherwise than by the [illegible] the will of the architect and the will of the contractor reach a state of statical equilibrium, the contractor will get the best of it every time—and does. The standard of ordinary work in this country is already not *what is right* but *what will do.* The builders run our building business, and are justified under the circumstances in doing so. If the specified standard is not genuine and intended to be carried out, the contractor can only set his own standard; but that will be set to suit his own purpose, which is to make money. The lower the standard he can get accepted the better for his purpose. The natural tendency of an uncertain standard in contract work is downwards. The cure is in reasonable specification, and carrying it out.

The Architectural League of America.

The Architectural League of America grew out of the new life that has come to architecture in recent years. It seems to be an integral part of that life and is expanding its operations so as to keep pace with the expansion of architectural effort, both in degree and in the kind of work, which is conspicuous just now in the United States, as in England and the countries of Europe. The only Canadian body affiliated with the League at present is the Architectural 18 Club of Toronto, a member of which, Mr. J. P. Hynes, is chairman of one of the committees of the Club. There is no reason why the Province of Quebec Association of Architects and the Ontario Association of Architects should not become members of the League. It is a question whether it would not be to their advantage. From a material point of view there is the stimulation of the League's literature:—reports on current civic improvement; an illustrated volume compounded of illustrations of the best works exhibited in the local exhibitions; and doubtless other developments in this direction;—there are scholarships, for study in the architectural course of Harvard University, and a travelling scholarship; there is a bureau for the formation of parties to travel and study in Europe, apart from scholarship winning. In many ways—in ways no doubt yet to be developed—the League is so active that we may fairly look to it to lead the way in American architecture. There is no doubt, however, that to follow such a lead is to follow in the direction of Americanization, and this word has not been one of entirely favourable import hitherto. At this moment we learn that the competition for the travelling scholarship is to be held on Easter Sunday, as a convenient day for getting the men together. This is Americanization and it is not worth following. It is this undue estimate, of the importance of material things and undue yielding to their pressure that is such a signal modern instance of the truth that the penalty upon us is to be satiated with our own ways. It is this that is making the world unpleasant to live in.

TORONTO ARCHITECTURAL STUDIO CLUB.

Eor several years the various efforts to institute architectural design classes in Toronto have not met with the success that should attend so important a [illegible]

This year the Toronto Architectural Studio Club have made a very successful start in the right direction from which much good should result to the members themselves and to the profession generally. This club is the outcome of meetings called by the architects in December and has been organized and entirely supported by the draughtsmen with the assistance of Mr. John M. Lyle who is acting as patron of the club. Problems are conduct along Beaux-Arts Principles, being set and criticized, until completion by the Patron and the final awards made by a committee of architects.

The first problem resulted in seventeen very creditable designs, and following were the awards made:

First mention.—W. B. Van Egmond.

Second mention.—Wm. Somerville, Norman Anthony, John Tsuvoi, E. H. Yeigh.

Third mention.—A. M. Weir, F. H. Banforth, J. J. Beck, F. A. Carney, R. Coutts, B. Frank Kelly.

"A Casino by the Seaside" is the subject of the second problem which is well under way and will be completed in April when an exhibition will be held of designs in both problems. It is the intention to start a new problem immediately on the completion of the present one, which will extend to the fall and will be splendid groundwork for next season when it is expected the problems will be in conjunction with the Beaux-Arts classes which are so successful in New York. Outdoor sketch work will also be taken up during the summer.

Much interest has been manifested by the members in their work as they are realizing the decided advantages to be gained by working together in a class of this nature, and they invited all Toronto draughtsmen desirous of a proper training in architectural design to take up the work of the next problem.

The club rooms are at No. 18 Richmond Chambers, 11½ Richmond street west, where criticisms are held every Tuesday and Friday from 5.30 to 6.30 p.m. and to which any person interested will be made welcome.

THE ONTARIO SOCIETY OF ARTISTS AND PICTURE MAKING.

The general verdict is that this is a good exhibition; that the standard of technique is high. That is true. The standard of technique is so high that we want something more; and it is a good time to talk about it. That is the general impression left by the exhibition upon the writer of this notice. As the exhibition will be over before this is printed we can only deal with the question in a general manner. It is not likely that the opinion expressed here is unique, and, so far as it is true, those who studied the pictures will probably find it recall feelings of their own which they did not take the pains to formulate.

There is an opinion among some artists, young ones chiefly, that a slice of nature is a picture. The writer recalls a conversation with a young artist, (female); fresh from study then; with the bloom of either London or Paris upon her, and all the dogmatism of discipleship in teaching not yet fully understood. The conclusion we arrived at was that a slice of nature *is* a picture and that the writer, in wishing to select from nature, is following the way of him who was a liar from the beginning. Let that be so. It is only a matter of [illegible] most any graphic representation, and agree with Bacon that "A mixture of a Lie doth ever adde Pleasure." But, if a straightforward study is to be our whole work, it must be carried out to such an extent that our pleasure is in the carrying out. Impressions or decorative effects, will not do here; the essence of these is composition.

But we do not find in the gallery any extract from nature that can pretend to such greatness in technique, or such effectionate development of the beauty of details, that our delight is in these and we value the extract as an extract. We should be glad to see some work of the kind. It is a worthy field of effort, or at any rate an honourable road by which to ascend to the greatest achievement. All the great men have approached greatness by way of it, and it must be the only sure road to greatness in art, for the distinguishing mark of all great art is delicacy.

The other field of effort is composition; still the representation of nature, but its representation with selection of facts, so as to express an idea.

That an artist should fail to either make much of the objects he admires or to make much of the idea they suggest seems to a layman like working without a motive.

Is a picture much to ask for; because it deals with ideas? Ideas are not all transcendent, but are of all degrees, like the race of men. We need only ask from a painter the idea he has, and we may be quite sure that somewhere among "the bourgeois who carry the purse," will be found one to whose mind it appeals.

The scene before me as I write suggests that a study of nature will best enable us to see what goes to picture making; for, the view up King street, (Toronto) out of my office window, strikes me, at the present moment, as a picture. It does not always strike so; then here is an opportunity to find out something of what goes to make a picture. This is March 19, the snow storm of the season. The air is full of a driving snow that obscures detail, so that the buildings appear as masses only, (and the situation is favoured in its building masses), rising from the snowy street to the gray sky, against which they are defined, sometimes by dark outlines, sometimes by ledges of snow on the cornices; and the general mass, so subdued in tint that it is hard to distinguish brick from stone, is delicately slashed with white, from snow lying on the projecting features of the buildings and piled on the sills of the windows and recesses which enrich the building masses with patches of a slightly darker tint. Down on the street the black figures of foot passengers serve a like harmonious function, by carrying the dark of the buildings into the white wedge of street. They, (almost entirely men), hurry along with heads down; giving a greater impression of the press of business than one receives in ordinary weather, when people stroll along at their ease and may be out for pleasure. The street cars pulling up at the corner every moment, each with its load of snow on top, add to the impression of how the daily life and labour of the city goes on continually, no matter what the weather. The whole of this, seen through the framing of a large window, and all pulled together into a gray harmony by the snow which fills the air with hurrying flakes, cut in an even [illegible] regular clouds, strongly reinforced occasionally by drifts streaming from the roof when a stronger gust than usual strikes them, all this makes [illegible] The question is wherein lies the pictorial essence [illegible] the expression of unity in detail, (the overhead wires are overpowered for once!), for the same view on a brilliant day is also a picture. It is not merely in the obvious breadth of effect. All effects are broad. The less obvious require the greater master to represent and therefore ought, and in fact do, make the greater picture. To seek only the obviously broad, or to simplify down to an empty breadth, is the practice of our decorative landscapists; with whom we have a quarrel on that account which it will be necessary to ventilate in another number, for want of room in this. The pictorial quality of this fine scene before me seems to lie in its definiteness. It has strong character, which possesses the mind and suggests ideas. The nature of the idea and the way of expressing it will vary with the artist. The grandeur of the storm is the great thing no doubt and it may fairly be said that the man who best represents that as his whole theme does the best service to the possessors of his picture, as he gives them the occasion for ideas of their own to arise. But pictorial art has its limitations. It is not possible to express the whole truth. Something must be suggested, and that

is where the artist comes in. We are all familiar with the whitening bones of horses and the ruined remains of waggons in the foreground of a prairie scene, conveying the suggestion that, though we can see but little of the prairie in the picture, it stretches many days' journey behind and probably many days' journey ahead. The ocean is a paltry thing to see; about eight miles is the utmost extent of it presented to the eye from the deck of a ship. It is a poor spectacle, except in a storm; and even then one is not happy with it. "Is this the mighty ocean," says the poet, "is this ALL." If a poet can get no further than that, what is the use of a painter representing it baldly and without suggestion. Some men on a raft, straining their eyes towards the empty horizon, would bring home to one the fact that there is a beyond full of unknown possibilities; but this is a dramatic and painful circumstance to disturb ourselves with and, worse than that, it is unusual and will not serve our purpose half as well as the simple everyday phenomenon of ocean life—the appearance of top masts above the horizon, before the vessel comes in sight; or the lingering of a steamer's smoke above the line after the ship itself, funnel and all, has dipped below. Some suggestion, some selection of incident, animate or inanimate, is necessary to convey the whole truth of a scene, the idea it aroused in the painter. Turner has a view of Salisbury Plain with a retreating thunderstorm and lightning streaming from it the ground. In the foreground is a dead sheep, with its lamb bleating beside it, which marks the recent passage of the storm and brings to our mind what he cannot depict—the noise and danger of the storm beyond us and the quiet and desolation it has left behind.

So, in our storm; we want more than a mere attempt to represent the appearance of the weather. There are accessory incidents which turn the mind, in one way or another, to conceive more fully what it was like. The choice depends upon the artist. One man may enjoy the accident of the electric railway's sweeper passing and the cloud of dust which it raises, and may portray to emphasize the city in the storm, and suppressed the sweeper which, (besides being too overpowering an incident), in sweeping the tracks, swept [illegible] of people, who dived into doorways as it [illegible] the moment depopulated my city of irrepressible toilers.

The sparrows too are an interesting incident. They flit about apparently unconcerned, looking very black, in the branches of a tree below which stretches its black arms across the road, (speaking in terms of perspective), and makes a valuable connecting link between the black building masses on each side. An old master or a great master would certainly work in the sparrows as a note of relief in the strenuousness of the storm. I confess insufficiency and place them here as a separate idea, like a little etching on the margin of a big one.

Surely—to return to our subject, the want of apparent purpose in so many of the pictures at the Ontario Society's Exhibition—it requires no great genius to perceive the makings of a picture in a scene, and the faculty must be cultivable by practice, so that the professional man will far exceed the layman in this perception. And he gives pleasure to the layman just in proportion as what he sees is worth seeing and as he can express it so that the layman can see it too.

CANADIAN ARCHITECT AND BUILDER COMPETITION.

A HOUSE OF SMALL COST IN A COUNTRY TOWN.

MACBETH.—Undoubtedly first. It is a convenient arrangement which will build well, and has at the same time the necessary elements of picturesque interest both inside and outside. The questionable points are remediable. These we should consider to be: (1) The sacrifice made in the width of the dining and living rooms for the sake of having a portion of the verandah sheltered in that way. The great value of this form of recessed shelter is the shadow it casts, (as will be seen in the rear elevation), but this effect though highly delightful to the eye of the mechanic (as he consults his sundial), requires the dining room to depend too much upon light from the side, which it was intended that the narrowness of the lot prescribed for this competition should discourage. To light a living room by a window three feet from the boundary line of the lot is bad work. (2). The seat in the hall would in practice be turned into a coat closet, and the question is whether it should not be made so at once by the hand of the artist. He would probably do better service to the hall's beauty by providing for its perpetual tidiness than by giving it that suggestion of refined and studious repose which constitutes part of the beauty of an alcoved seat. The mechanic and his young family, (a mechanic's family is always a young family), will do little sitting about with books in their hands. (3). There is not much wall space in the kitchen, and it is a question whether the pantry would not be better entered from the kitchen porch, (which does not require two doors). (4). There may be some question about the step from the hall to the rooms but there is no question about the beauty it adds to the house, and fortunately it serves a useful purpose at the foot of the stair in making an entrance into the kitchen at that point compatible with headroom in the cellar stair.

[illegible] Plan [illegible] ided and indicating material well except perhaps roof which [illegible] th rest [illegible] faults, too [illegible] d verandah with [illegible] house. Canopies over windows and dormer treatment of doubtful value considering the cost.

ECONOMY.—The plan is a plain plan which, though good in the main, seems to lack originality. It might be much improved by a little more thought. Exterior shows proper use of rough cast—on an upper storey protected by eaves and out of reach of wanton injury. Drawing sober and good without dash. Drawing reserved for publication.

CANADIENNE (girls head in tuque).—The effort to give an effect of space by opening up the rooms is commendable, but there is much to be questioned about the comfort of the arrangement. Chimney not bulky enough for suggested stone, and upper part of stack small and tame. Drawing shows hesitancy.

FACTUM EST.—This designer has fairly met the terms of the problem and therefore gets place above what either the artistic conception of his plan or its artistic rendering would warrant.

His plan is similar in outline to that of Economy but much more compact. A good enough plan of the angle shape which too many of the competitors have favoured

above the square form we think. The sitting room, with front door opening into it and staircase proceeding from it seems to be transformed into that uncomfortable object of some women's ambition know as a "reception hall". That it is intended for more domestic use is shown by the piano. Factum Est is to be commended for laying down his furniture in the plan; though this practice need not enter into the drawing of any but the sketch plan. As to the execution of drawings would say that a wash drawing should have less line and a line drawing less wash. The coloured perspective is juvenile; not so bad in tone of color, but lacking quality of light. If the position of the larder were changed, the chimneys could be grouped into one stack which would be better. Drawing speckled and uncertain.

Drawing reserved for publication.

DOMINION.—With the exception of the verandah, which is unduly costly, this is a feasible house and the most interesting of the original plans, but it has too many faults for a good place; faults which seem to indicate want of attention to practical matters. The verandah, for example, besides having only five feet of width, as a result of the expense of building it in the manner drawn, occupies at its base the whole width of the lot, and the eaves project on the neighboring lots. The columned archway to the living room does not suggest a mechanic's cottage; and comfort, with the front door so close, would be better served by a door. The dark pantry is quite unnecessary; for the larder might take the place of the coat closet; the kitchen entry be (more conveniently) in part of the present pantry space and the pantry moved up to the window. A coat closet if needed would come out of the hall, leaving only a portion of the stair open.

OWL.—A good plan with originality in position of stair; but think one lean too from front of gable might be worked with advantage. It is not good practice to make the middle of the three gable windows higher than the other two. Drawing clean but lacking blackness and vigour.

ICTINUS.—Is good in plan with space well utilized; we think, however, that east window of dining room should be dispensed with. The four gables necessary to make 1st floor available are too much and a little extra height of wall would dispense with those on front and rear, and there would be gain in repose. Drawing clean and with certain vigor but hardly correct in scale; the window bars and other features being coarse. Drawing reserved for publication,

(1,500).—At first sight a good plan with just sense of space values, but on second thoughts would judge ingle nook spoiled by necessities of traffic to kitchen and to upstairs. Drawing clean but crude. Drawing reserved for publication.

PALLAS.—The wide single pane windows of the exterior are on a different scale from the general composition of the house. The interior is greatly wanting in simplicity. Drawing wanting in decision.

511,15.—A story and half house with bedroom and bathroom downstairs to overcome lack of space in half story. This is neither comfortable nor really economical. If there is to be parlor in this class of house, think fireplace should be in dining room which is used as sitting room.

X.—Plan simple and provides the accommodation fairly well. Suggest steeper roof and more accentuated gablets as improvement to front. Drawing rudimentary.

HOPE.—Drawing weak and undecided style of house; two stiff and German like for good Gothic; plan not bad but too spreading; and hall and stair case pretentious for house of this class.

N.O.T. PEN.—N.O.T. Pen is to be congratulated on putting three elevations, a perspective and two plans of an American Gambrel roof house, as good as the majority of such, on a piece of paper 7½" x 12". The drawings denote considerable knowledge but he has put absurd limitations on his work by using such a poor little bit of absorbent paper.

WHEEL OF FORTUNE.—Is strongly reminiscent of a style of city house which never had any reason for its prevalence, being without distinctive character as a home. Drawing neat and if done by young person gives promise of better things when confidence of touch is gained.

OUR ILLUSTRATIONS.

CANADIAN ARCHITECT AND BUILDER COMPETITION. A HOUSE OF SMALL COST IN A COUNTRY TOWN. DESIGN AWARDED FIRST PRIZE, BY MR. E.H. YEIGH; DESIGN AWARDED SECOND PRIZE, BY MR. W. B. VAN EGMOND.

Comment upon these designs is included in the report of the judging committee on page 36.

VIEWS IN BERLIN AND ST. PETERSBURG, ILLUSTRATING THE PAPER BY PROFESSOR P. E. NOBBS ON THE OFFICIAL ARCHITECTURE OF EUROPEAN CAPITALS.

DINING ROOM FIREPLACE AT THE NOOK, BIRMINGHAM, ENGLAND. MESSRS. CROUCH AND BUTLER, ARCHITECTS.

Messrs. Crouch and Butler are the authors of a book called the Apartments of the House which errs on the side of over culture of antiquity. Our illustration is an example in their own work of their deduction from old examples that half timbering should be shown on the [illegible] of a house in the [illegible] of [illegible] in place.

ARCHITECTURAL STUDIO CLUB, TORONTO. DESIGN FOR VILLAGE CROSS, AWARDED FIRST MENTION.

Under this general term was included any central object, for a cross-roads or common, having some public utility—as a clock or fountain.

We have obtained this drawing partly with the design of calling the attention of Toronto students to the advantages of joining the club.

The account of the club on page 36 has been furnished us at our request. It should be added to that account that the club has a constitution and fees but membership is unlimited.

SKETCHES IN OLD QUEBEC BY MR. J. ROXBURGH SMITH, MONTREAL.

Our reduction of these very nice pencil sketches has not done full justice to them. While we regret to be obliged to say this we take the opportunity of warning students that the pencil drawing and washed drawing are very difficult to reproduce with an effect equal to the original. If they want to have sketches that will reproduce well, they should draw for reproduction—that is in line and with a material that is truly black, as India ink or crayon.

THE OFFICIAL ARCHITECTURE OF EUROPEAN* CAPITALS.

Mr. Chairman and Gentlemen:

It is with very special pleasure that I find myself again before you after a lapse of two years, for the kindly welcome which you extended to me when first I visited Toronto as your guest is one of my most cherished memories. I was then new to Canada and to my duties at McGill and had been here just long enough to fully appreciate the difficulties of my task and not long enough to realize how best to assail the problems that presented themselves to me. Your sister association had not taken any pains to veil its candid opinion that a school of design at McGill was not to be taken seriously. It was thus with very uncertain feelings that I journeyed hither, in 1904, and I am delighted to have this opportunity of thanking your association for the moral support I then received—really gentlemen I went back from Toronto on that occasion very greatly strengthened by your kindly welcome and I find myself again among you wtih sincerest pleasure.

I must congratulate you gentlemen on the spirit of striving after better things which the subject of this year's conference makes patent. Let us hope that your example of civic pride and interest in the questions of city improvement may one day be felt eveo as far as Montreal and may help to bring even her authorities to a sense of their responsibility and duty to the future inhabitants.

Our theme this morning is the Official Arcbitecture of the European capitals and from its nature this discourse will have to resemble somewbat a "personally conducted" lantern show to some extent. It is, however, not part of my intention to bore you with ancedotes, name or dates, and I may as well say at once that the important points, I wish to bring out, have not much to do with the actual architecture we are going to look at which, as a body of work, I find inexpressibly uninteresting.

First, we sball bastily review the ancient world's official architecture with a view to forming an opinion on what such work has always and should ever express. The origins of the modern school of official architecture in France will be touched on, but the scope of the paper will not admit of any serious consideration of Paris; which may be the less missed as it is so well known. With London we shall have nothing to do; not because official art is there wanting, but because her official buildings are in a class by themselves, not belonging to the general school of work inspired by the Grand Siècle in France.

St. Petersburg, Berlin and Vienna are our particular prey this morning, and after reviewing these we shall formulate some theories and derive some lessons. . . . .

What precisely is meant by official architecture may be best explained by a glance at the history of our age.

I hold most strongly that in general, rapidly traversed history is always dull; but it is essential to my effort to analyse what official architecture does and should express: to trace its earlier manifestations. I beg your patience [illegible] the official architecture of Rome, which was the link between the ancient art of Greece and the modern classicism initiated at the time of the Renaissance in Italy.—For it was from the Roman and not from the Greek remains that the Italian architecture of the XV and XVI centuries derived the traditions which have ever since remained the basis of the language of official art.

M. Viollet le Duc in those lectures, which in spite of the way that archæologic research has tended to upset his favorite theories, will always remain a source of immense inspiration to those of us who take the trouble to ponder over the whys and wherefors of our art, bas aptly summed up the Roman position with regard to art, maintaining that the art of government of men was the one native and natural accomplishment, and that the Roman gladly borrowed his plastic art from those he conquered but used it then in a characteristically political way for the glorification of the Senatus Populusque Romanus and for the good of the conquered people.

The great combined groups of buildings set out in axial systems, were the Roman contributions to our subject; and not only in Rome but in all the provinces it was the policy to ereet official Halls of Justice, baths, theatres, temples and monuments.

Such, then, were the aims and the ideals of Roman official art—art definitely fostered by a government for definite political purposes for the first time.

Christianity with its humble beginning was destined over and over again to manifest her inheritance of Roman ideals by great architectural enterprises which cannot be described as other than official.

Santa Sophia at Constantinople, finally dedicated by Justinian in A.D. 563, was the work of one of the last great builder Kings of the ancient order of things when war and building were the chief duties of Kingship.

The building of the Gothic period is of an essentially different intention from the official work of the ancient and the modern world. It is in spirit spontaneous as opposed to being inspired. Cities and nations united to engage in great architectural enterprises it is true, but the political stimulus is absent. Even in the instruction of the Florentians in 1294 to Arnolf, the architect of the cathedral—"to make a design with the most exalted and most prodigal magnificence in order that the industry and power of man may never create or undertake anything whatever more vast or more beautiful"—the note of pious sacrifice to the glory of God is more clear than the note of civic pride, which is also, it must be conceded, present.

Leaving the Gothic Period as essentially non-official, the next rkl nada on our course is the erection of St. Peters at Rome. Founded by Pope Julius II in 1506 as a private mausoleum proportionate to his sense of his own dignity, and completed in 1626 as the central church of christendom, this building expresses the close association of Christianity and Neo Paganism in its time. The Pope had become the true successor of the Roman experts and, as Symonds aptly says in his life of Michelangio, "the new temple embodied an aspect of Latin Christianity which had very little indeed in common with the piety of the primitive church. St. Peters as we see it now represents the Majesty of Papal Rome. It is the visible symbol of that Schism between the Teutonic and the Latin branches of the Western church, which broke out soon after its foundation and became irreconcilable before the cross was placed upon its cupola."

Besides St. Peters and the many palaces of the princes of the church, we have in the group of buildings in the capitol, a deliberate reminiscence of such great schemes of official art as the Forum of Trajan.

The XVII and XVIII century official buildings of Paris, and even more, the arrangement of public places by the King,s architects, must be touched on (though I do not propose in any sense to review the official buildings of the Paris of to-day). These works constituted the models for all the European official architecture, even as the French official system of administration, as evolved in the Grand Siècle forms the model European government to this day.

We must now turn to the German Capital.

Berlin was a very unassuming business city till after the Franco-Prussian War, for it was with the milliards extracted as war indemnity from France that the Imperial government set about adorning its capital.

The Palace and the old Brandenburger Thor, at the entrance to the park, gave the cue to the city improvements commissioned [illegible] connects the palace with the park.

A glance at this quarter of the city shows how active the authorities have been during the last 30 years; for the "Prussian Diet" the "Reichstagsgebeude" or imperial parliament house, the museum and picture galleries and the Cathedral, are all modern; as are also the University buildings and technical schools, which, under so paternal a government as that of the Hohensollerns, may well be classed as official.

These buildings need not detain us long. They are all externally well built and ably planned. They all lack to my mind the highest qualities of architecture. It is remarkable that the Teutonic temperament with all its intense seotimentality, extreme earnestness, and enormous vigour, fails so conspicuously in the arts. The essential courseness of fibre in the German character permeates German art. The natural graces of the national character, the kindliness, the sympathy and the culture seem strangely enough to fail to find expression in their art, and particularly in their official art, which is somehow always imbued with the bombastic swagger of the jingling spur and the mailed fist.

It may of course be personal idiosyncrasy on my part which prevents my appreciating German art. At least let me say that I do appreciate German kindness and German culture.

The intemperate swagger of German heraldic decoration has pervaded the Denkmæler or monuments, with which a keen sighted government has adorned the city and advertised the virtues of the Imperial house it serves.

Opposite the palace is an equestrian statue of the grand old emperor William, backed by a colonnade and surrounded by

* Paper read at the annual meeting of the Ontario Association of Architects by Prof. Percy E. Nobbs, of McGill University, Montreal.

lesser groups. The whole conception is in the grandiose spirit introduced into architecture and sculpture by Michelangelo and elaborated under Louis XIV. It is art of the kind which supplies all the needs of the beholder—a great banquet if you like and you must taste it all. Nothing is suggested and notbing is veiled in mystery.

Then again in tbat splendidly kept park the Tiergarten where, in order that the green carpet may reach to the very roots of the noble trees, different varieties of grass are carefully grown, we have an all but grotesque exhibition of imperial pride. Leading from that most blatant of all monuments of victory, which celebrates the Franco-Prussian war, we find a noble avenue lined on one hand witb a set of monuments illustrating the long line from which the Emperor springs. Now many of these ancestors were very ordinary princelings and some were quite nonentities while the great Frederick and the old Emperor William were men of international scale.

I suppose the fact that the designers wish to express is that all these persons were equally great, and mainly great because they were ancestors of the Kaiser. Anyhow they all have equal honour done them in a series of designs in various styles all of a size and all of one scheme.

In the focus of a raised semicircle of white marble stands the Ancestral prince while on the dies of the balustrade behind him are found—busts of his two chief advisers. The national passion for order is well evinced in this absurd scheme for if the old Emperor William, Moltke and Bismarck make a good trio it does not follow that the local nonentities of Prussian administrators in other periods deserve recognition at all. This is not the way to express history in art—one page to the man—it is neither good history nor good art, and the chief interest to a designer is to note the cold scholarly ingenuity with which something of the decorative method of many centuries has been applied. (I use the word applied advisedly) to a Greek semicircular garden seat that focuses on the back of a Kaiser's ancestor, which appears of absorbing interest to the two henchmen behind.

Vienna is the centre of fashion for Eastern Europe, drawing to its mighty heart all the rank and style of not only the Austrian Nations but of English, Germans, Poles, Russians and Balkans.

A glance at the plan will show how this old city has been remodelled by wise official care.

The original town is now enclosed by a car track instead of a wall and on each side of this main circular route we find noble spaces and parks with fine groups of public buildings.

As this great boulevard wheels gradually around we are saved the extreme regularity and monotony which characterizes the great Commonwealth Avenue of Boston. Interminable boulevards are, to my way of thinking, akin to nightmares. The sense of helplessness one feels, on l[illegible] impressive but it is not comforting, if one has to get to one end of it in a hurry. Axial planning has become too axiomatic with the T square designers of modern cities, and I think such a system as that of Vienna with its noble axial groups of buildings set picturesquely about an ever turning boulevard should get more attention than it has yet got. Vienna is one of the most impressive capitals in the world. Nowbere has a sense of dignified luxury and pleasurable pomp, been better expressed in architecture. The buildings, themselves, are not very striking; just the ordinary civilized European classic; but the massing and the disposition are unexcelled. There is a good deal of official statuary in commemoration of the exciting history of comparatively recent times.

I shall never forget the hazy winter morning when I first strolled tbrongh the city of Vienna. Here the busy narrow streets of the old town contrasted with the wide park circle, with its great masses of building standing up in grey blue silhouette against the morning pink.

St. Petersburg or Petersburg, as those who have lived there call it, differs from the other Europenn capitals in this that it was a city laid out and planned in modern times. In 1702 it was a swamp with a swedish fort overlooking the river. The city rose at the command of Peter the Great, and the magnificent lay out of the plan was developed under Catherine II. whom, I regard as the last of the great royal builders of Europe. Petersburg is a city of brick and plaster. The classic Palladianism of its public buildings is only skin deep and requires continual patching and painting. The street architecture is tinted in the cheeriest colours; pink, yellow and pale green being the favorites; but blue and chocolate are often met with. There is thus not much in the way of nobility or dignity in the architecture, and the charm of the place depends chiefly on the magnificent scale both of the buildings and the streets, and the skillful lay out of the city as a whole. To my mind the noblest official monument in Petersburg is the quay. On both sides of the river there are about 5 miles of red granite quays, the parapet consisting of great blocks which are simply moved out of the way when a barge unloads its cargo.

The famous Winter Palace is a plaster building, of pronounced Rococco type architecturally unworthy of its fame. It is painted in two sbades of pink, and has a certain picturesque richness when seen across the river. The most original building is the Admiralty, which is painted white and yellow, with a green roof and a gold spire, and forms 3 sides of a quadrangle facing the river. The bottom square has unfortunately been built up with residences and palaces, but the two great archways abutting on the river some 600 yards apart form splendid stops to so huge a building. The delicate spire (and spires and towers bave always been the strongest line of the Russian architects) is placed at the focus point, from which the three great streets of the city radiate, and gleams from miles away. There is no finer effect in city arrangement than that of a dome or spire at the end of a great vista of houses or an avenue of trees.

A glance at the plan of St. Petersburg will show that, if the individual buildings are spiritless, the *tout ensemble* is eminently interesting and noble; and, considering the flatness of the site, wonderfully picturesque.

As notable buildings I might mention (1) the Exchange, (2) the Holy Synod, (3) the Academy, (4) the University; all of which are strictly government works, or official in character. With monuments Petersburg is well supplied and I might mention first St. Isaac's Cathedral which was built as a thank-offering to celebrate the victory over Sweden when Finland changed hands in 1809; the dome of plate gold, about 1/16 of an inch thick, swallowed up nearly all the indemnity I believe. After the Russo-Turkish war of 1877 a great church was erected in Moscow in a similar spirit of victorious piety. Of the architecture of Moscow I need say nothing here for it is not only a thing very much by itself but essentially non-European.

The Russians are great bronze founders and some excellent statues adorn the public squares.

Having now reviewed as much official architecture as will afford us food for reflection we may consider a few points of a general nature.

Of the sameness of it all I shall have more to say in conclusion but we may here note that the classic style remains everywhere as the natural vehicle of official architectural expression. Gothic public buildings have been attempted at Manchester and at Westminister with mixed success, and there [illegible] to be said for classic motif is resorted to.

Classic buildings suffer from indiscriminate juxtaposition more than Gothic buildings do, the scale in Gothic work being essentially persistent while in classic it is proportional to the [illegible] Buildings of equal height in one and in three orders simply ruin one another if placed side by side while any Gothic group is held together by the fact that millions are never very much more or less than 30 inches apart.

There is therefore all the more reason why ample spaces and careful general schemes such as that of Vienna should be resorted to if classic public buildings are to be mutually improving instead of mutually destructive in effect.

Time does not permit me to say more than a word about Place and Street planning. Paris, which was ruined from the picturesque point of view when Haussmann drove its great boulevards for strategic reasons through the town, has came to be accepted as a commendable example of city layout. In a recent paper on the plans of cities and public places in the R. I. B. A. journal, Mr. J. W. Simpson has gone into this question of great intersecting thoroughfares, basing his observations on Herr Stübben's monumental work *Der Stædtebau* forming part of *Das Handbuch der Architectur*.

By the way, Wren's plan for the rebuilding of London shows us both the right and wrong kind of spider's web system.

Where streets radiate from a building or a bridge no harm results; but traffic is simply clogged by Union Jack plans, with a central fountian to make confusion worse.

Mr. Simpson's paper is a plea for the asymmetric or picturesque arrangement of open spaces, and what he has to say about placing monuments along side great buildings, by way of contrast in scale and diversion of interest is very suggestive. His

paper is a healthy protest against the axial T square planning which has made so many modern cities deserts of dreariness. By all means let us plan for symmetry, when an effect is wanted, and let us rejoice in long vistas, when there is anything at the end of the vista; but let us remember that the beauty of symmetry in a lay out cannot be at all enjoyed unless there is an asymmetric note by way of contrast.

And now we must say a general word on the official use of sculpture. It is deplorable how that noble art, once the handmaiden of architecture, is following the lead of painting and degeneratiog to the manufacture of chimney piece ornaments and mere household gods.

England is worse off than any of the old countries in ornamental city statuary. The figure exalted upon a pedestal is about all the British Civic adorner's mind runs to. The French delight in mighty groups of vivid dramatic power; often in doubtful taste, but nevertheless "La Glorie" and "La Belle France" find true and generic expression in French public places and parks.

The Italian sentiment is newly revived, nationality expresses itself in equestrian statues of the Kings in great new squares; and neither the statues nor the squares are artistically worth the beautiful old work which is too often ruthlessly destroyed to make way for these official city improvements.

I do not think that great systematic schemes of sculptural adornment, such as that at Berlin, can ever be successful. The men and the events and the ideals to be so honored should be more discriminately chosen.

In spite of all we can say against the spirit and execution of the official statues adorning modern European Capitals, there is no denying that the intention is right. The noble epic art of sculpture should be at its best in dealing with great patriotic themes, and it is deplorable that, having such a history as we have, and such inordinate prosperity as we have, this empire of ours should find as little use for sculpture.

In conclusion gentlemen let me endeavour to answer two questions in the light of what we have been looking at.

First: What does official architecture as we find it in Europe express, as a direct sentiment?

Secondly: Judged from the ethnographic standpoint—by which I mean the consideration of architecture as the expression of the historic and social influences of the time and place in which it is generated—let us enquire why is the official architecture of Europe so similar in form?

Official architecture must express the sentiments of order, dignity, power and pride; for it is called into being by the exigencies of social organization, the end of which is government; and its aim must always be at once to express the dignity of authority and to foster the sense of loyalty to the community, which is ever the basis of power of

struggle for the survival of the fittest among the organized states of the modern world are alike the legitimate source of official architecture. The late Samuel Laing, in the conclusion of his treatise on modern science and modern thought, has pointed out that the good of humanity at large is too vast and incoherent a sentiment to adopt as a mainspring of human effort, and action and counsels the more limited idea of loyalty to the welfare of the community to which one belongs, as a surer inspiration of life. It is this sense of loyalty and pride that public architecture should above all things express—public self respect. Professor Baldwin Brown, of Edinburgh, wrote me a day or two ago "The best of architecture is that it is so democratic; appealing, whether effectively or not, to the public at large." It is the very thing about our art which has caused the wise rulers of a hundred generations to use this art in a political spirit. And this brings me to the second question—why is the official architecture so similar in form?

The spirit of our time is above all things this, that government has become a complicated science, and that, wherever one goes in civilized lands, the same system obtains. The welfare of the people may be regarded by officials as the means of ensuring the power of the state; or the broader view, that the power of the state is the best security for the welfare of the people, may be the ultimate test of policy and administration; but, whichever way the official mind regards its duty, the practice throughout Europe is the same. Whether the government be an autocracy, a limited monarchy or a republic, the official technique of modern states is all but identical. Now let us enquire whence this science of government has been derived. In two words this question can be answered—Rome—France. A century hence it will be possible to add England; but the principles of parliamentary power are still in their infancy, as far as Europe is concerned, and the model of governance by a beaurocacy is still the European ideal.

The Roman ideal of a national mission, and incidently of the place of art in the political system, is amply explored in Viollet le Duc's third lecture, entitled "a comparison between Greek and Roman Architecture," in the conclusion of which he says, of our own time, that it is "a compound of the traditions of classical antiquity, of the influence of the spirit of Christianity, and of the long struggles of the middle ages."

When we consider how all our systems of law are saturated with the principles of Roman law, the common law of Scotland and Holland especially; and also how the Renaissance in Italy revived for the modern world the Classic traditions of thought and literature; we see very good reason why modern states should carry on the traditions of Roman art, as an outward manifestation of the principles that underly their very being. But there is a certain similarity in all this work, which is even more distinctive than the use of Roman orders. I refer to the obvious influence of the Academic school of XVII and XVIII century France. In her introduction to that intensely practical and suggestive work. "Art in the Modern State," Lady Dilke says: "to the student of the modern social system, (and I would add to the student of art), a minute knowledge of the life of France during the Grand Siécle is indispensable. The France of Richelieu and Colbert gave birth to the modern State; so that, if we would know anything accurately about the modern political and social organization, we have to look to the system which lies at the root of its growth."

Now a very important part of that system was the recognition by the State of the relations between art and industry, and the centralization of art education and of artistic effort by the Government of France under the enlightened Colbert, which resulted in the academic official school of architecture.

Not only did the European states institute government schools of architecture on the French system but these schools naturally carried on the French Academic traditions, and so it is that French influence on modern governmental methods is reflected in the French influence of modern official art. Lady Dilke further states that the Architecture of the Grand Siècle is not only all Royal but all monotonous and this characteristic has been accepted with the rest. It is indeed only during the last few years that we note any attempt on the part of Russian, German and Scandinavian architects to put something of local tradition into their work, as an expression of nationalist sentiment and a reflection of the Gothic Revival in England last century. Even the red tape chancelleries of Europe are be- to tire of the dry formu- chool.

ably always be so, and it is a source of immense satisfaction for us to note how the spirit of the freer classic of England is likely to express the development of the parliamentary system during the coming century.

What are the lessons then that this great body of official work can teach us which may be of use to us in the scheming out of our own great city problems?

First: I would say we have realized the importance of great buildings having great spaces about them, planned out with a sense of scheme. And this can only be contrived at a reasonable cost when the cities are young.

Secondly we see every reason for adhering to classic tradition for public work; but I mould add a rider to this—that classic does not necessarily mean French academic and there is room in a scheme of formal dignity for national tradition. Let our classic be the English classic evolved by that great series of artists Jones, Wren, Hawksmoor, Gibbs, Adams, Chambers, and resuscitated with added vigour by Brydon and Norman Shaw who is still happily with us exercising a beneficent influence on the vast schemes of city improvement in Liverpool and London.

Gentlemen if ever you again honour me with an invitation to your conferences I hope you will permit me to choose for my theme the classic revival of the XIX century in England. Many schools of architecture are good and detectable for the cosmopolitan; but those that have a note of national temperament are best for those who have the good fortune to own a nationality; and it is in our public buildings above all that this note should find tuneful expression.

MONTREAL NOTES.

The approaching season promises to be a busy one for the building trades in Montreal. As last year the banking businesses continue to push forward in what is to them good investment and advertisement. The Royal Bank proposes to erect, in St. James Street, an imposing building, ninety feet in height, with a front of white marble. The dominating feature is to be an Ionic colonnade with pillars forty feet in height. The building is to become the head office of the bank. It consists only of three storeys which will be devoted to banking purposes. The architect is Mr. H. C. Stone. The Dominion Guarantee Company is to erect, at the corner of St. James St. and St. Michaels Lane, a three-storey office building which has been designed by Messrs. Ross & Macfarlane. The City and District Savings Bank is to build a new branch office at the corner of Ontario Street and Maisonneuve Street. Mr. A. H. Lapierre is the architect. The new branch of Molsons Bank, at the corner of St. Catherine Street and Stanley Street, from the designs of Messrs. Finley and Spence, is now completed; and the Bank of Quebec, at the corner of St. Catherine Street and Amherst St., by Messrs. Cox and Amos, is rapidly approaching completion.

Churches seem to have started on a sort of stampede from the central parts of the town to the outlying quarters. The Church of the Messiah, on Beaver Hall Hill and occupying the site of the original Beaver Hall, is now being converted, or shall we say apostatized to baser uses. The building was not without a real if humble architectural merit, though sadly marred by a tin spire and wooden traceries simulating stone. Its site on the salient portion of the bend of the road rising steeply from Victoria Square is one of charming possibilities. Nothing however need be hoped for here at present, as the church seems to be in process of being cut and chopped about to suit some kind of manufacturing business. The new church of the Messiah is to be built on Sherbrooke Street, near

The Emmanuel Congregational Church is to have a new building on Drummond Street near Sherbrooke Street. The work was entrusted to the firm of Saxe and Archibald as the result of a limited competition; one of the first competitions, we suppose, to be conducted according to the new code of competitions recommended by the P.Q.A.A. which is thus beginning to bear good fruit. Mr. Darling, of Messrs. Darling and Pearson, of Toronto, was the assessor. The tower of this church, as shewn on the competitive drawings, is the choragic monument of Lysicrates; and, as the front porch is, within a little, the Erechtheum it promises to be a model of all the architectural virtues, neatly bound together. It is a little disappointing after this to find that the material is only to be light grey brick with sandstone trimmings. The seating capacity of the building is to be one thousand persons. The scheme includes large Sunday school and lecture hall and the cost is to be in the neighbourhood of $80,000. In several other cases congregations are discussing the advisability of moving their tabernacles to points where they may fairly expect to be within walking distance of their members. The Italian colony is to build, at the corner of Dorchester Street and St. Timothy Street, a church and school, on which they are preparing to spend about $75,000.

The demand for apartment houses continues unabated; at least new projects go on to development. The Linton estate, on Sherbrooke Street, has not yet begun operations in this line; but it is understood that quite a large block, to cost $750,000, is to be erected here. At the corner of Pine Avenue and Durocher Streets "The Pine Avenue Apartments" are about to be built, providing accommodation for thirty-five families. The architects are Messrs. Finley and Spence. The materials will be red brick and white sandstone. It is estimated to cost $150,000.

An important work of a utilitarian kind will be a new warehouse for the Terminal Warehouse & Cartage Co., Limited, a building to cost 200,000 dollars. It is to be erected between Grey Nun and King streets below Commons. There will be six storeys, all of fireproof construction, no wood being employed; windows and doors being of iron. The walls will be of brick; the total floor area 120,000 square feet. A special feature of the building will be the wine vaults. Messrs. Marchand & Haskell are the architects.

Concerning the additions to be made to the Windsor Hotel, to be built on the site of the old Windsor Hall and adjoining buildings, one is glad to find that fireproof structure is being aimed at. The quantity of iron piping spreading like some strange creepers over so many down-town buildings, blossoming into water curtain nozzles in front of cornices and windows, bears witness to some hard thinking being done on the subject of fireproofing just now. The Hotel building is to be nine stories high and the drawings show a roof with high pitched curve, of a type which our reading of the building act had led us to believe was prohibited in Montreal, owing to danger to the public from ice falling from the eaves. In the matter of design the elevations do not aspire to much. The architects are Messrs. Hardenburgh & Bradford L. Gilbert, of New York. Their local confederates are Messrs. Hutchison & Wood. Not unnaturally the plac- -tion as to whether United States architects should not be excluded from practising in Canada till such time as this amiable republic shall see fit to permit Canadians to practice in their free and enlightened reservations.

The Province of Quebec Association of Architects has appointed a Committee on City Improvement. This consists of Prof. Nobbs, chairman, Messrs. J. R. Gardiner, J. O. Marchand, E. Maxwell, W. S. Maxwell and Jos. Venne. This Committee is putting itself in communication with the City Council and all associations interested in the subject. By this means the Association seems in a fair way to obtaining an effective influence in civic projects. Already the long discussed question of the mountain look-out has been referred to this Committee, and the standing of the members composing it is a guarantee that such matters will be treated in a broad intelligent spirit, free from suspicion of private interest. Some of the bodies which are taking an interest in the Committee's work are the Montreal Fine Arts Association and the Parks & Playgrounds Association. The latter body, which has lately been increasing in influence, has recently been applying for powers to hold property on an extensive scale, and is a society that exists purely for the benefit it can be to the public.

THE SKETCH CLUB OF THE P.Q.A.A.

STRUCTURAL STEELWORK.

On Wednesday evening, February 14th, Mr. J. L. Harrington, of the Montreal Locomotive & Machine Company, addressed the Club on the subject of Structural Steelwork. The system of tall framed building, he said, originated in Chicago, a city which had plenty of room for expansion and which adopted the system of tall buildings simply owing to the value of central building sites. New York soon followed; and in this case the naturally confined city limits formed an additional incentive to this kind of building.

As the most valuable recent collection of reliable and original data on all matters relating to the design of Steelwork in buildings, Mr. Harrington called attention to Mr. C. C. Schneiders paper read before the American Society of Civil Engineers. One of the most remarkable facts which Mr. Schneider may be considered to have established is that the actual load on the floors of large office buildings never exceeds 40.2 lbs per foot on any floor and that, considering the building as a whole, 17 lbs per foot is the highest recorded average. The heaviest load that is likely to occur is that of a portable safe which may be anything from 2,000 to 16,000 lbs. Special provision ought of course to be made for weighty articles of this kind.

As it is extremely unlikely that all the floors of a building should at any one time be loaded to their maximum, the building by-laws of some cities now permit a reduction in the calculations for each storey of 5 per cent. on the storey above until a 50 per cent. reduction has been reached. This the lecturer considered a fair and safe rule.

When a building is exposed to severe wind strains, as is very often the case, the wind braces should be an integral part of the framework of the building. It is not safe nor sufficient to trust to partitions, especially where these are only inserted after the framework is erected.

As regards the details of structural steelwork, Mr. Warrington referred to the divergence commonly occurring between the forms [illegible] in practice. A method suggested merely by the calculation of a particular case is often so difficult of execution as to be unreasonably costly and in the end insecure. Hence the necessity of adhering to standard sections of materials and types of connections which workmen being accustomed to can make a thorough job of. The lecturer exhibited sets of blue prints showing such types of work.

THE LOUIS XV STYLE.

Mr. W. S. Maxwell spoke to the club on the subcect of the Louis XV style. The French renaissance styles he said deserved study if only for the reason that they have exercised appreciable influence over half the world. The style of the period of Louis XV differs from that of Louis XIV in the introduction of a certain severity of composition. The period of the intervening regency was was marked by a very appreciable improvement in the condition of the bourgeois class who began to build houses for themselves in great numbers. They generally preferred the country. Their homes were frequently characterized by an inferior taste, but as often display a great deal of good sense.

Under Louis XV it was felt that little was being done of any important nature in architecture, and something like a revival of the magnificence of the time of Louis XIV was aimed at. To this end many fine blocks of buildings were erected in Paris, numbers of which, while externally resembling magnificent palaces, were internally divided into more or less modest dwellings. The King himself, tired of the burdensome magnificence of life in the great palace of Versailles, built the Petit Trianon in the grounds as a dwelling wherein a man might take a little real pleasure.

The architectural compositions of the time bear evidence of much studied elegance and gracefulness of line. Sculptural work is executed with astonishing technical skill and spirit, especially in the horses and other animals which the sculptors of the period delighted to introduce. Often enough these sculptures are open to the criticism that they are applied with little regard to their architectural setting.

The interior work of the period is the most characteristic and remarkable. Full and even loaded with detail it is yet arranged with art enough to carry it all off. The workmanship is of the highest order. The greatest artists of the day such as Boucher and Watteau did not disdain to apply their talents to the details of interior decorations. Boffrand was probably the most distinguished decorative artist of that or any other period. Restraint and dignity distinguish his work from that of his contemporaries. Whilst the details are endlessly varied the general scheme of treatment of interiors is very uniform. The floors are generally of marquetry in simple geometrical patterns. The walls have a low panelled dado with tall panels over, extending to the start of the cove which is the customary manner of forming the junction with the ceiling. Smaller pannels over the doors are favourite positions for decorative paintings. The panel molds break at the top into foliage, with pendants, garlands, etc., executed in relief in wood or plaster; delicate flowers being introduced with sparkling effect. In the painted decorations, the nude figures of the preceding epoch were supposed to shock the gay world of Louis XV., which delighted in daintily dressed shepherds and sh[illegible] that the prudishness was not to be taken too seriously.

Mr. Maxwell illustrated his remarks by a large number of lantern slides which he had had specially prepared for the occasion.

GLASS SAND.

The manufacture of glass requires a purer sand than that used for any other purpose, and glass sand is therefore higher priced than other sands, says A. T. Coons in Mineral Resources of the United States. The chief impurities are iron, alumina and clay, which color the glass and give it a cloudy appearance. These impurities are removed by washing and sometimes, in the case of iron, with a magnet. The purity of the sand used is regulated by the quality of glass desired. Glass sand is mined in more or less pure state from deposits of sand, and it is also obtained as a rock easily disintegrated when exposed to the air, or from hard sand stones, which have to be crushed before used.

To renovate varnish work make a polish of 1 qt. good vinegar, 2 oz. butter of antimony, 2 oz. alcohol and 1 qt. oil. Shake well before using.

The Aiza Company, Limited, of Montreal, whose advertisement will be found in the present issue, publish a number of excellent testimonials in favor of their Patent Window Device, the purpose of which is to facilitate the cleaning of windows without the danger which usually attaches to this work.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Inquirer" :—Will you kindly explain how to build a cheap driving shed about 16 x 30 feet and oblige.

ANS.—Our correspondent is not very clear as to the kind of driving shed he wants. A simple driving shed is an easy matter to construct as it only requires a back and the two ends; as shown in Fig. 1 which gives an end section. These three sides may be "sided" or

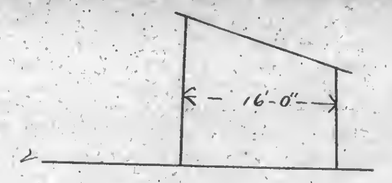


FIG. 1.

they may be boarded "up and down" or they may be rough boards and sided, or rough-cast. The posts may be round poles, or may be squared timber 6" x 6" and about 10 feet from centre to centre. The plates may be 6-in. x 6-in. or 6-in. x 8-in. and rafters 2-in. x 8-in. The roof may be rough boarded and shingled or a tar roof may be put on. There should be sills or ends and back but the front posts should be on stone foundations sunk below the surface of the ground. If a better shed is wanted, having room over head for hay, it may be built as shown in Fig. 2 which in this case butts against a barn or stable.

From "Finisher" :—I am finishing a room that was "finished" in dark oak, a number of years ago, and I have a n[illegible] the new work look like the old, which has evidently

FIG. 2.

been fumigated. How can I fumigate this work to look like the old ?

ANS.—Articles of oak are given an appearance of age or enriched in colour by shutting them up for a time in an air-tight cupboard or box, on the bottom of which have been placed dishes of liquor ammonia; ½-pt. is generally sufficient for a box 9-ft. long, 6-ft. high and 3-ft. 6-in. wide. It is a good plan to have a few squares of glass inserted, through which the action of the fumes can be watched. A well made packing case will do, with strong brown paper pasted over the joints. This process will give shades varying from light olive to deep brown. Its chief advantage is that it does not raise the grain. To test whether any kind of wood can be darkened by fumigation, take a piece of freshly planed up one side, take the stopper out of the ammonia bottle, and lay the wood over the mouth. The vapor of course, will be strong, and if the wood can be darkened; it will very soon show a patch of altered colour. A small bit of wood will do, anything large enough to cover the bottle's mouth. On a large scale you can try by pouring some of the ammonia into a cup, and covering the top in a similar way. For fumigation to be effective, it is, of course, necessary for the woodwork to be perfectly free from grease or marks of handling. Should a case large enough to hold the wood not be procurable, a small spare-room may be made to serve the purpose if the precaution be taken to paste paper over any openings, such as the fireplace. Fumigated oak is generally finished by wax polishing, but there is no reason beyond custom why it may not be french-polished or varnished. Some kinds of oak are not susceptible to ammonia vapor. It is not always convenient to adopt fumigation, but a like result can be gained by wiping over with a solution of hichromate of potash, common soda, or lime-water.

From "Young Workman" :—Some time ago you had a reply to a correspondent on "Kerfing" but the method described did not seem to apply to all cases. Would you kindly describe a method that would be applicable to all cases, if such is possible and oblige?

ANS.—A reliable method by which a board may be kerfed to follow any circle, or segment of a circle, is explained by sketch. Take a lath, A, Fig. 3, equal in

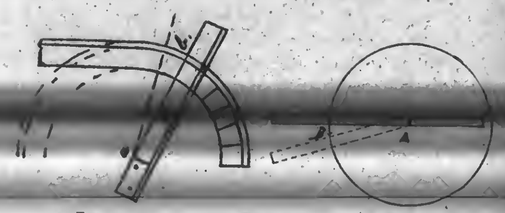


FIG. 3.

FIG. 4.

width to the thickness of board to be bent. Gauge the lath from one edge, leaving same veneer as on the board, mark the radius, a b, of the circle on the lath and run in saw kerf down to the veneer line. Fasten the lath down and pull the other end over until the saw kerf is closed, which gives the spacing for kerf. Care to be taken in using the same saw.

The next method is somewhat similar. Referring to Fig. 4 take a piece of stuff the same thickness, and cut a single kerf. Place the piece on edge with the kerf at the centre of the circle. Depress one end until the kerf is closed as indicated by the dotted lines. The distance that the piece is moved on the circumference of the circle will be the distance to be used between kerfs. This rule will work on any size circle and any thickness of board. In Fig. 5 of the sketches the piece is kerfed from the back instead of the face. As these kerfs will not close, but open wider and are not seen, the only rule necessary in spacing is that they be sufficiently near together to allow the board to

bend easily. Make a form by tacking blocks on the floor, wetting the pieces with warm water; and then as it is bent around the form follow closely with two strips 3/8 x 1-1/2 or 2 inches, nailing them as you go. These strips should be on the edge next the floor, and when nailed all around turn the circle over and nail strips on the other edge the same way. When finished the circle will retain its shape, the face will show no sign of kerfs and will be stronger than if done the other way. I would suggest to readers of the paper and especially the correspondent inquiring, that the plan be tried. I could send you several other methods

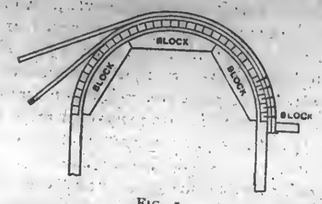


FIG. 5.

but the ones shown are among the best. With regard to books, methods of kerfing can be found in nearly all books on carpentry. If the "kerfing" is to be made for work on a "rake" the saw kerfs should be sawn on the same rake or bevel as the work itself, and then the kerfed piece will bend properly around the raking circle. This method is often employed in building up circular strings for spiral stairs.

From "Draftsman" :—Will you kindly answer the following question and oblige an "old Reader". Would a small reception room look well in white enamel with white stairway and treads, but has a cherry-rail? About how much would it cost to have the upper sash of the windows cut into diamond lights? Should the hangings and other furnishings be in accord with the detail finish of the house? Would putting up fluted columns between hall and parlor spoil a plan for mission furniture in hall?

[illegible] your room would look very pretty if properly treated in the manner you mention. The cost of putting in diamond lights would probably be about one dollar per pane. We do not consider that it is absolutely necessary that furnishings must be in accord with the detail finish of the woodwork of the house. Of course, if mission columns are used, it will be necessary to make them exceedingly plain; and straight and void of fluting. Indeed, it would be better to have them made square as that shape would be more in keeping with mission style.

From "Decorator" :—Will you please describe the kind and number of tools required for gilding and furnishing and oblige.

ANS.—We give here with a number of tools employed by the gilder.

Paint brushes, of various sizes, are useful for laying on the size and for fastening the gold-leaf. The latter is of various thicknesses and tints, and is termed "single", "double" and "thirds", being sold in books of 25 leaves, 3¼-in. x 3¼.

A gilder's knife is long and thin with a very sharp and smooth edge, and is required for cutting up the leaves as they lie on the pad.

The cushion or pad, is a piece of flat wood, about 8-in. x 6-in. on which the leaves are cut to the size wanted. It is covered with several thicknesses of flannel overlaid with chamois leather and partially surrounded by a screen of parchment to ward off draughts and prevent the gold leaves flying. It is held by the insertion of the thumb in a lopp beneath.

The tip is a broad, thin brush made by glueing camel's hair between two pieces of cardboard, 3½-in. wide and 2-in. long, and with it the ragged portions of the leaves, etc., are softly smoothed away. It is also used for removing the gold-leaf from the cushion to the part to be gilded.

A bob is a ball of soft chamois leather stuffed with cotton wool, for pressing the leaves down.

Burnishers, of agate or flint, are likewise employed and pieces of clean cotton wool, wet and dry.

Note :—We have a number of querries, which, owing to their late arrival, are held over until next month.

"PAUL'S CROSS."

In the north-eastern corner of the churchyard of St. Paul's Cathedral, close to the wall of the church, is the site of Paul's Cross, an open-air pulpit from which, from very early times in the history of London, sermons were preached and proclamations made. In several Continental churches—notably the Cathedral of Perugia—such external tribunes still remain, generally against the church wall, with access by a door from the inside. But Paul's Cross, the London mediæval and later example, was a detached structure. An illustration in the issue of the Daily Graphic, of January 27th, shows it as it was in its later days, with its little room, its projecting pulpit and enclosing wall, within which the privileged—sometimes Royalty itself—sat, and its open surrounding space where the citizens, seated on benches or standing about, listened to words of wisdom—or otherwise.

PREPARING A CANVAS COVERED PORCH FLOOR.

Answering a correspondent of that journal who asks [illegible] second-storey porch floor [illegible] covered with canvas and then painted, a recent issue of the *Painter's Magazine* has this to say: "The floor should be oiled first and then coated with a very stout pure lead and oil paint, in which the stretched canvas is laid and nailed down with galvanized iron tacks. The canvas is then given a good coat of pure lead and linseed oil paint, on which a finishing coat of good floor paint should be applied."

Over 100,000 men employed in the building trades in the city of New York have agreed to fixed conditions with contractors regarding wages etc., for a term of three years, the agreement taking effect on January 1st this year.

The splitting of stones, rocks, and the swelling up of moist ground during frost are caused by the fact that water penetrates into the pores and there becomes frozen; in short, the great expansion of water on freezing is the most active and powerful agent of distntegration on the earth's surface.

The effect of retempering mortar of Portland cement and crushed quartzite has been investigated in the laboratory of the United States Office of Public Roads. There were five briquettes in each set of specimens, one set of neat cement and the others of 1 : 1, 1 : 2 and 1 : 3 mortar. The briquettes were made in three series; A, of mortar put in the molds immediately after mixing; B, of mortar allowed to take an initial set, and then broken up and made into briquettes; C, of mortar allowed to take its final set, and then broken up and made into briquettes. Series B showed practically the same or higher strength than Series A except in the 1 : 3 mortar, where the falling off averaged 81 pounds. Series C showed a falling off ranging from 5 pounds with 1 : 2 mortar to 117 pounds with neat briquettes. Enough water was used in tempering to give normal consistency to the mortar.

THE CHATHAM CENTRAL HEATING PLANT.

The City of Chatham has the distinction of being the first in Canada to install a central heating plant. The system is steam, installed by the American District Steam Company, of Lockport, N. Y., as an adjunct to the Electric Railway Company. The exhaust steam from the power house is used for the heating plant, and the shareholders of the heating company are the shareholders of the railroad.

Although new in this county, there is no reason for predicting anything but success for the system. The installing company have already over two hundred systems of the kind in successful operation in the United States. The waste by the non-use of exhaust steam in large works must be enormous, since nearly 90 per cent. of the steam generated is discharged. A heating system of this kind is therefore a true economy; and when run in conjuction with power works of sufficient magnitude, its success seems guaranteed. In other respects the advantage is obvious. To turn on heat as one does light, without having any of the encumbrance, labour, dirt or danger of its generation on the premises, is a decided advance in the art of comfortable living. We shall doubtless see a large extension of the application of this system in towns that have grown up to the railway point and are not within reach of water power.

The essential condition of successful heating, where the steam in conveyed so long a distance, (there are 4,300 feet of main supply pipe in Chatham,) is an insulation of the pipe that will allow the steam to deliver to the customer as nearly as possible all the thermal units it contains when it leaves the central station. The insulation adopted by the American District Steam Company is a tin-lined wood casing, having a shell 4 inches in thickness, with an air space between the casing and the asbestos covered pipe, which is inserted therein. This casing is made of white pine staves, tongued and grooved, and bound together with heavy galvanized steel wire wound spirally. The surface is then covered with asphaltum and sawdust. With this covering the steam is said to be carried long distances witn very slight loss from condensation. The pipes are all laid to a grade to prevent any accummulation of water from this cause.

It is necessary also to provide for pipe expansion by joints that will require no packing or other attention after the pipe is once installed. This is taken care of by a patented device which takes up expansion, with-

AN ARCHITECT'S ASSISTANT
in England (student R.I.B.A.) aged 25, desires engagement. Good general experience. Working drawings and details, with knowledge of and experience in all branches of the profession of an Architect and Surveyor. Good Draughtsman and Constructionist Testimonials. Apply Box 75, ARCHITECT AND BUILDER, Toronto.

A. W. Connor, B.A., C.E. R. E. Clarke, B.A.Sc. W. Monds, B.A.Sc
CONNOR, CLARKE & MONDS
CONSULTING ENGINEERS
Fireproof, Steel or Reinforced Concrete, Office and Mill Buildings : Towers
Hydraulic, Municipal and Railway Work : Machinery : Complete Industrial Plants. Cement Testing Laboratory.
36 Toronto Street TORONTO

The Roofers' Supply Co.
LIMITED
WHOLESALE AND RETAIL DEALERS IN ..
ALL KINDS OF ROOFING MATERIAL
Slate, Roofing Felt, Roofing Pitch, Terra Cotta Tiles, Galvanized Iron, Sheet Copper, Slate Nails, &c., &c., &c.
Foot of Bay St. - TORONTO

HAPPY THOUGHT FOLDING PARTITION FIXTURES
are what you require to ensure positive, uniform and easy motion, for all widths and heights of opening.
O. T. SPRINGER,
BOX 44, BURLINGTON, ONT.

TENDERS WANTED
A Weekly Journal of advance information and public works.
The recognized medium for advertisements for Tenders.
CANADIAN CONTRACT RECORD
TORONTO.

WOOD FIBRE PLASTER
IMPERIAL PLASTER CO., LIMITED, KING STREET WEST, TORONTO

INTERIOR MARBLE WORK
J. G. GIBSON MARBLE CO.
TORONTO
CRUSHED MARBLE FOR TERRAZO FLOORS

This is the Sheet Metal Age
THE GALT ART METAL CO.
Please your clients by specifying our line of :
GALT "SURE-GRIP" SHINGLES
Striking in appearance, tight as a pail.
GALT "ART SIDINGS"
Very bold, handsome stone and brick effects. Heavy and prominent mortar-lines and tuck-pointing.
GALT CLASSIC CEILINGS
Harmonious designs, interchangeable parts. Wood brackets behind joints give perfect finish.
CORNICES and SKYLIGHTS
Any design or style promptly executed from architects' details.
CORRUGATED SHEETS
and all accessories.
Architects should have our catalogues
THE GALT ART METAL CO., LIMITED
GALT, ONT.

out being itself subject to motion, and so prevents strain and creeping.

The mains are twelve inch pipe. Lateral branches decrease according to the amount of service required of them.

Where a building is already equipped with steam radiators, but a few minor changes are required. Hot water radiators can be adapted to the service; or, if the customer wishes to continue heating by hot water, steam is supplied to a special form of water heater which is installed. It is simply, in effect, the use of steam instead of fuel to heat the water in the boiler. The condensation from the steam is conveyed to a cast iron economizing coil, or torm of hot water radiator, in the basement. This coil is placed in a tin lined enclosure, together with a steam trap. A register in the ground floor delivers the heat from the coil to the room above. After all available heat has been utilized, the water flows to the meter, which records the condensation in pounds and the customer pays a price per thousand pounds of water. Every pound of water registered by the meter shows a given number of British thermal units delivered in dry steam.

Steam heated buildings have their use of steam rated in the same way, by meter. It is obviously fairer than a flat rate; for not only are equal spaces different in exposure, glass area, and excellence of construction, but the habits of the occupants are different. People have various tastes in heat and some buildings are not heated all the time. Under the meter system, heat not used is saved. Churches, schools, lodge rooms, stores, &c., can be charged exactly according to their use of heat, and will use it exactly as they wish to be charged.

THE BUILDERS' EXCHANGE OF MONTREAL.

The Annual Report of the Builders' Exchange of Montreal is a document of considerable interest. We extract a portion which has passages referring to matters of general interest to the building trades and others.

The one source of "danger ahead" in the activities of the coming year lies in the ever-recurring labor problem. If labor leaders would be well-advised, as much in the interests of labor as of capital, they would hesitate in forcing wasteful and pernicious strife upon the building trades' employers. With legitimate trade-unionism we have no quarrel; the spurious article we shall contest in the future as in the past. When unions assume an attitude of despotism by their latest methods of endeavoring to restrict output; to refuse apprentices; to interfere with internal control of shops and factories by walking delegates; to boycott particular employers by black-listing their goods; and to induce sympathetic strikes in trades with which they have no quarrel, we must in self-defence co-operate by being thoroughly prepared and organized. "Whoever pays the piper has the right to call for the tune," and employers must fearlessly assert their liberty to employ competent workers irrespective of being union or non-union men. Contractors do not begrudge just wages to competent workers, and wages can always be satisfactorily adjusted by mutual conference; but arbitration with irresponsible bodies without liability for breach of contract, is mere waste of time.

This leads us to the subject of technical education—a worthy field for practical philanthrophy, following the lead given by Sir Wm. Macdonald in other branches. The crying need of all trades to-day is for competent mechanics. The unions, whose pride it should have been to admit only such to full membership, have exerted their influence steadily in the opposite direction, in the persistent effort to establish an artificial uniformity both in output and wages—a glaring injustice to the capable mechanic as well as to the employer. All incentive to self-improvement is thus taken away from the worker.

The practical abolition of the apprenticeship system and the fatal facility with which many things are learned superficially, from laying bricks to legislating for the nation, has filled the land with "half-baked" men—men trained for nothing in particular and good for nothing in general.

The practical solution is for employers to revert to the former well-tested system of "articled apprenticeship," and to take a personal interest in training the young men so bound, making this youthful period of life attractive by encouraging friendly competition in technical schools.

Your directors cannot too warmly urge a federation of all the Employers' Associations in corporate union with the Builders' Exchange as a central nucleus, representative of their individual and united interests. By such consolidation we could speak with no uncertain sound in all labor questions. They also ask your co-operation for closer intercourse and more cordial relations with the architects, and would suggest a joint representative conference at an early date to discuss the advisability of a uniform contract; a responsible method of furnishing quantities; the protection of sub-contractors and the amendment of the law as to the unjust responsibilities now resting upon both architect and contractor as to liability for structures.

The need a commodious Builders' Exchange building will be one of urgency in the near future, and your Directors are strongly in favor of a permanent exhibit, wherein sample and desk-space can be rented, as an attractive and beneficial addition to the advantages offered to our members.

The new officers of the Exchange are: President, R. G. Hood, (Wm. Hood & Sons); Past President, Mr. N. T. Gagnon; Vice President, Mr. Jos. O. Deslauriers; Directors, Messrs. John Duthie, (Forsyth Marble & Granite Co.), Alex. Bremner, (Cement & Supply Dealer), W. E. Ramsay, (Sheet Metal & Supply), John Gray, (Gray & Wighton), J. N. Arcaud, (Master Painter's Association), J. Lefebvre, (Master Plasterers' Association), W. B. Shaw, (Electrical Contractor's Association), Jos. Thibeault, (Master Plumber's Association); Secretary Mr. J. Henry Lauer.

The Standard Ideal
Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron
Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QUALITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTATION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

CURLY GABLES.

To the list of stock features in modern architectural practice which have been pilloried in these columns at one time and another we think the overuse of the curly gable should be added. The fronts of buildings are disturbed quite enough as a rule without any playful fancy in gables. The curly form has the distinction of antiquity, but we are inclined to regard it more or less with suspicion. It never was a particularly logical use of material. A gable coping requires to be protected against the penetration of water and the consequent disintegration by frost, but the curved and twisting outline of the Dutch gable does not carry off the water quickly enough. These Dutch gables, however, were built of bricks, and the same necessity for care in this respect did not arise as with stone copings. If the mortar which kept the bricks in place was disintegrated it could easily be re-pointed, or the brickwork reset. But with stone the material, once loosened, is irretrievably damaged, and the forms copied to-day from the brick gables of the past are unsuitable with stone coping. Apart from this, moreover, the effect of the gable upon the general design of a modern building is more often than not distressing. Whereas the gable end of the Netherlands usually gave relief to a somewhat plain street front of a house of narrow width, modern frontages are wider and generally embrace many more decorative features, containing two or three gables. The curly gable thus creates an unhappy effect. It quarrels with the rest of the front and destroys all restfulness or austerity; the building becoming overloaded. There is a further development in the use of segmental gables. From a practical point of view this form may rank next in efficiency to the straight pointed gable, but we feel that it was more appropriate in its original position—namely, at the end of a barrel roof—than as now commonly employed. The outlines produced by pitched roofs of many little gables and gablets running against segmental gables are not particularly pleasing, and the gables of flattened curve or hog-backed gables are the ugliest and most ludicrous of recent architectural inventions.—*Building Journal and Architectural Record.*

HAND HAMMERED LEAF WORK

OF ANY DESIGN IN IRON, BRASS OR COPPER

Our Facilities for Turning Out Work of this kind are Unsurpassed. Write for Estimates.

CANADA FOUNDRY CO., Limited
Head Office and Works: TORONTO, ONT.
District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	-	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	-	W. A. LANGTON, "
2ND VICE-PRESIDENT	-	JOHN E. BELCHER, Peterborough
TREASURER	-	H. B. GORDON, "
REGISTRAR	-	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS

OFFICERS FOR 1905.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. E. VANIER, "
TREASURER	J. R. GARDINER, "

COUNCIL.

JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS W. SELF, 1st Vice-President.
C. W. BATT, 2nd Vice-President.
JAS. CRANG. Treasurer.
H. MARTIN.
THOS. CHERRETIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLARK AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO. WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.
J. JONES.
CHAS. GOULD.
T. WRIGHT.
H. STRATFOLD.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADERY
C. P. SHINDLER
K. M. FRASER
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G. BEAUDRY, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms
Directors: T. G. Latimer, R. Case, F. Powell, M. B. Martineon, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Girvin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.
JOS. O. DESLAURIERS, Vice-President.
J. HERBERT LAUER, Secretary.
N. T. GAGNON, Past President.
W. E. RAMSAY.
W. B. SHAW.
J. LEFEBVRE.
JOHN DUTHIE.
JOHN L. HARRINGTON
JOHN GRAY.
ALEX. BREMNER.
J. N. ARCAND.
JOS. THIBAUDLT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTOIS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new Pullman with all latest innovations for travel comfort, leaves Chicago 10.05 P. M. daily, arrives Los Angeles 4.45 P. M. third day via Chicago, Union Pacific & North-Western Line and the Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to the general agent or address, B. H. Bennett, 2 East King Street, Toronto, Ont.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

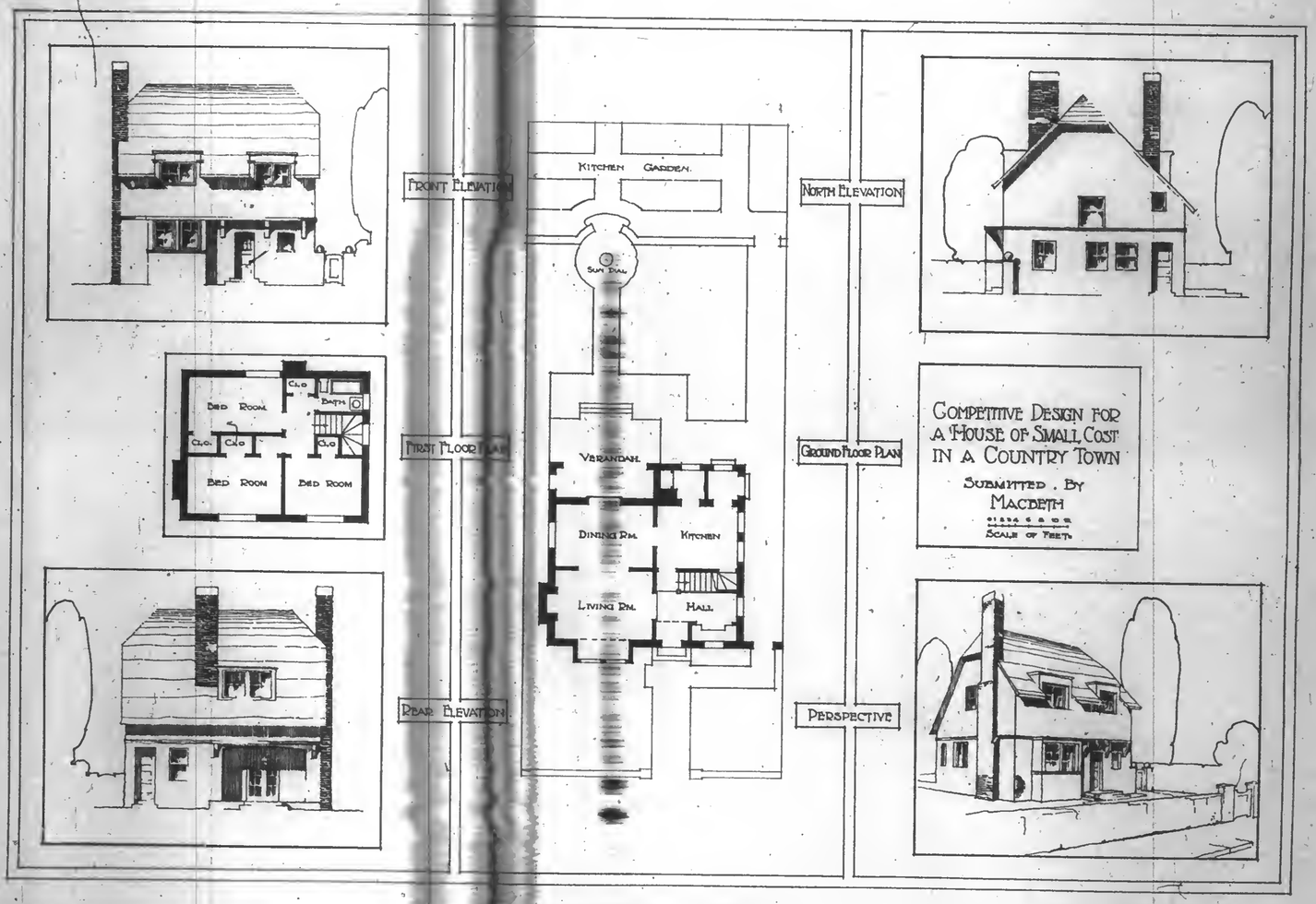
THE ROYAL PALACE AND MONUMENT TO THE EMPEROR WILLIAM I. AT BERLIN.

MONUMENTS IN THE TIERGARTEN, BERLIN.

STATUE OF PETER THE GREAT AT ST. PETERSBURG.

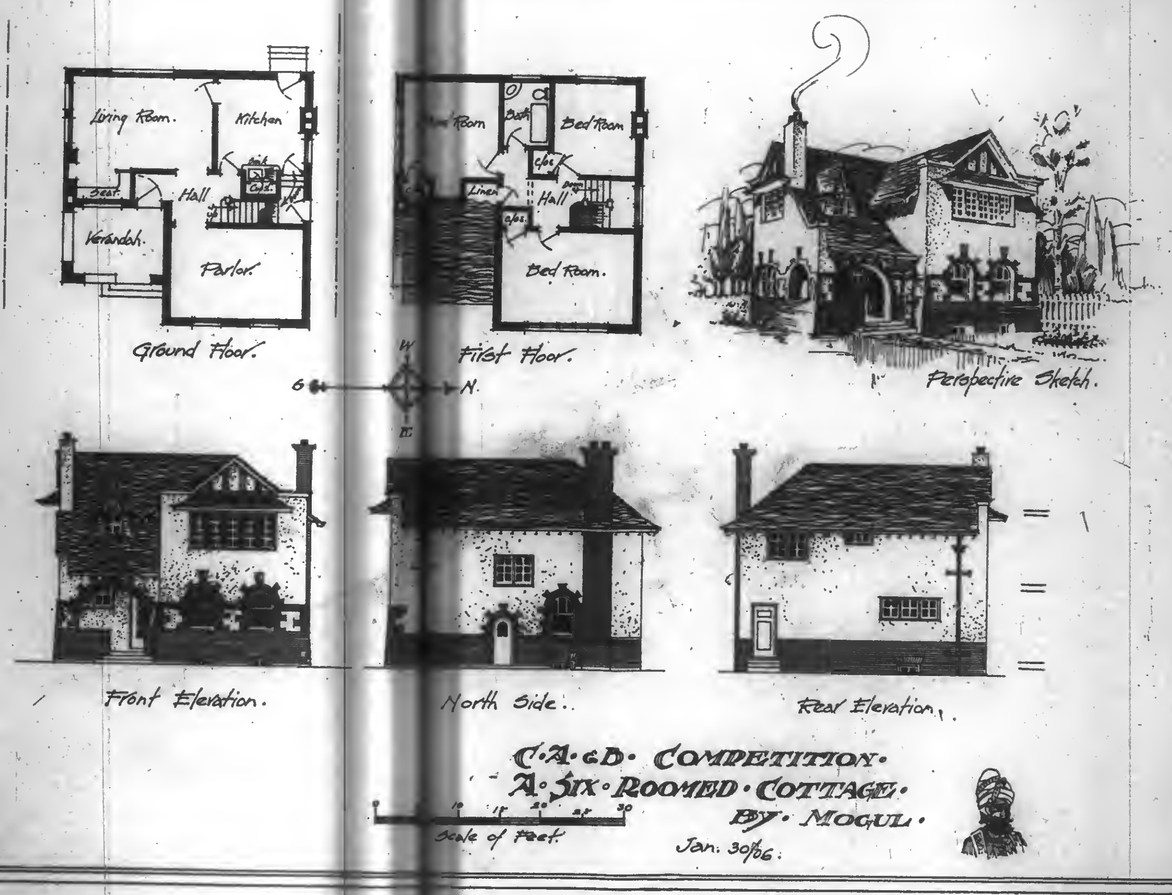
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER

ILLUSTRATIONS TO PAPER, ON THE OFFICIAL ARCHITECTURE OF EUROPEAN CAPITALS, BY PROF. P. E. NOBBS.



SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1906

CANADIAN ARCHITECT AND BUILDER COMPETITION.
DESIGN BY MR. F. H. YEIGH, TORONTO; AWARDED FIRST PRIZE.



SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1906

CANADIAN ARCHITECT AND BUILDER COMPETITION.
DESIGN BY MR. W. B. VAN EGMOND, TORONTO; AWARDED SECOND PRIZE.

LIVING ROOM FIREPLACE AT THE NOOK, BIRMINGHAM.
MESSRS. CROUCH & BUTLER, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MARCH, 1906

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 220. APRIL, 1906.

ILLUSTRATIONS ON SHEETS.

The Molsons Bank, Toronto Branch.—Messrs. Finley & Spence, Architects, Montreal.
The Home Bank of Canada, Toronto.—Mr. Beaumont Jarvis, Architect, Toronto.
The Linton Apartments, Montreal.—Messrs. Finley & Spence, Architects, Montreal.
Canadian Architect and Builder Competition, design by Mr. Victor G. Steer, Toronto; Awarded Third Prize.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Cathedral Church of St. Boniface, St. Boniface, Manitoba.—Messrs. Marchand & Haskell, Architects, Montreal.
Westminster Palace, from the Victoria Embankment, from a Photograph by Mr. J. P. Hodgins, Toronto.

CONTENTS

Editorial	49-50	The Sketch Club of the P. Q. A. A.	61
Decorative Painting	51	Correspondence	62
Books	51-52	Report of the Executive Board Architectural League of America	ix-x-xi
Our Illustrations	53	Heating by Exhaust Steam in St. Thomas	xii
Heating and Ventilating of St. Paul's Hospital, Montreal	54-55	To Clean Marble	xii
The Montreal Builders' Exchange	56-57	Architects Come High	xiv
Intercommunication	58-59		
Montreal Notes	60		

REMOVAL NOTICE.

The Montreal offices of this paper will, on May 1st, be removed from the Alliance Building to Room B 34, Board of Trade Building, St Sacrament street, where our friends and business acquaintances will always be welcome. The telephone number will remain unchanged, Main 2299.

The Illuminating Engineer.

A new Person has been added to the complexity of building affairs. The Illuminating Engineer has arisen; with a Society in New York, The Illuminating Engineering Society, constituted last January for "the advancement and dissemination of theoretical and practical knowledge of the Science and Art of Illumination"; and a technical journal, The Illuminating Engineer, Vo[illegible] just reached us.

The Sprinkler Tank Danger.

The fall of the tank in Montreal which caused the death of Miss Ross was the second disaster of the kind in Montreal within ten days. So we learn from a resolution of the Montreal Builders' Exchange urging special inspection of these erections. The first accident attracted little attention. We wait for something dreadful to happen before we are aroused; even though we have suspected danger before. It is about a year since it was suggested in this journal that trestles of exposed steel were not a safe form of support for these tanks, in view of the danger of collapse in case of fire, endangering the lives of firemen. Now is the time to speak of that again; a brick tower is the proper form of support. "If we must have these elevated ornaments", as the Montreal Builders' resolution pathetically says, let them be made both safe and decent looking.

The proposal in the Builders' resolution has three heads:—(a), the appointment of a special staff at once to make a thorough inspection of the support of tanks already existing—over a hundred of them; (b), the control of future erections by making permits necessary; (c), subsequent periodical inspection.

The moral of the occasion, however, is that new departures in building inspection, (as in insurance or other inspection), should proceed not from disaster but from test cases arising out of zealous insistence by inspectors on the intention of their office until the law is either found or made to support them.

The Steel Frame Building in an Earthquake.

As far as we learn from the newspapers at the time of writing, the steel frame buildings in San Fransisco were not damaged beyond repair, viewed from outside. Nothing definite has been said about the interior; nothing that would convey an idea whether the floor arching remained in place, so that there was no fire must of done much to obliterate the records of the earthquake, but no doubt there will be a careful investigation of all obtainable evidence in this matter, for apart from its serious interest to other cities, the future of San Francisco as a city of great buildings, which is almost the equivalent of a great city, will depend upon the justification of the steel frame by this test—the first, or the first severe test, that it has been subjected to.

It is probable that the rebuilding of San Francisco will show a further development in steel frame design; a development that ought to have taken place before now. The weak point of the skyscraper, in both design and construction, is the continuous surface of the outside shell—a rigid envelope to a slightly flexible frame. If the recommendation of a steel frame for an earthquake belt is the capacity of the steel to endure racking, it should be mated with a system of protection that can be moved by the racking without breaking up. This is only to be managed by building the storey walls separate not only from each other, but from the vertical and horizontal frame protection. It means building and protecting the steel frame first, and then inserting the storey walls. In earthquake regions, at any rate, the storey walls should not be bonded with the frame

protection. This means or should mean a difference of plane, making the steel frame protection a veritable framing for the fitting. Building is not thus made more difficult but rather easier. As to the strain on the designer, universal experience goes to show that designing is hardest when one is on the wrong tack, and unquestionably this is the right tack for steel frame design.

The International Secretary.

At the end of 1905 a notification was sent to the granite manufacturers of Toronto by the local union ordering that all granite cutting in Toronto must be done by union men. The McIntosh-Gullett Company declined to obey this order. Its men were called out on strike and were replaced by non-union men. Mr. J. McIntosh, the president of the McIntosh-Gullett Company, is manager of the Stanstead Granite Company at Beebe Plain, Quebec. In this capacity he was notified that, if he did not settle the Toronto strike the Stanstead employees would be called out. He replied to the following effect :—(a) that he did not control the Toronto concern and was not in a position promise for it ; (b) that, as manager of the Stanstead Company, he could and would let work it had in hand for the Toronto Company stand until the Toronto strike was settled ; (c) that the Stanstead Company had a contract with the union that did not expire until 1908. He even sent the secretary of the Stanstead Company to the secretary of the International Union with the proof that the two companies, with the exception of one or two shareholders who were interested in both, were independent concerns. The international secretary was unmoved ; the threatened strike was "the best weapon they had and they intended using it." And they did ; the Stanstead men were ordered out.

The *Montreal Gazette*, from which we get our facts, asks pertinently in what respect this united action of the Stanstead and Toronto unions differs from the plumbers' combine in Toronto that was so severely

according to their contention, merely for purpose of giving a good standing to the plumbing business and to plumbing work. Incidentally they got high profits. Incidentally also, (to take a very broad view), the combination of the Stanstead and Torouto unions extorts from a Toronto firm certain conditions of employment held to be beneficial to the Toronto union. To do so involves the violation of a contract and the disablement of the Stanstead Company for fulfilling contracts which it has undertaken and for which it may be held liable. The *Montreal Gazette* excuses the inaction of the legal authorities in this case on the ground that "the union is, legally, a mere wraith upon which no man may place his hand." How to prove the facts is a question, when "the real centre, the mainspring of the act is a foreigner, an alien, outside of the jurisdiction of the Canadian courts." This foreigner supplies the funds which maintain the strikers in their position, legal or illegal. Invested Canadian capital is at his mercy ; a kind of mercy which tempers justice on the wrong side, introducing into this country the new doctrine that contracts are not binding if inconvenient.

The situation is not tolerable. It is time the unions ceased to be "a wraith" and became incorporated. Then we might get our fellow citizens to respect our (and their) laws as much as the mandate of a foreign potentate, for their funds would be answerable in fines and damages for breaches of law and contract.

The Toronto Art Museum.

An Art Museum for Toronto is at last in sight. A committee of gentlemen has been at work for some years, creating interest in the project and getting subscriptions; and it is announced now that a building will be available soon for the collections which they hope to acquire. Membership to the Museum is to be of four classes—Benefactors, Founders, Life and Annual members. Benefactors are donors of $5,000 and upwards; Founders are donors of $1,000. These will have their names inscribed on the walls of the Art Museum. The payment of $250 gives Life membership. The Annual membership fee will be $10 a year for laymen and $5 a year for Art students and members of any recognized Art body. A member of any class will be entitled to admission without charge, for himself and a family of five, to the museum buildings and all art exhibitions held therein.

The first public effort of the Museum is an exhibition of pictures by painters of the Glasgow School, which have been procured by the Provisional Council of the Museum in conjunction with the Ontario Society of Artists. This exhibition is now going on. The pictures came to Toronto from the Albright Art Museum of Buffalo, where they were exhibited for sometime, having been procured by Mr. Charles M. Kurtz, Director of the Albright Museum, for exhibition there and in other galleries in the United States.

The exhibition is one of great interest. The Glasgow School has been so called from a temperamental similarity in the work of the painters that is quite marked in spite of differences of aim and education. The one point the artists have had in common as an educational influence has been the opportunity of

which came, during their period of youthful effort, a regular stream of works by Delacroix, Corot, Monticelli, Daubigny, Rousseau, Diaz and the Marises; loaned by wealthy Glasgow merchants who, having apparently that same sympathy with French art which is expressed in Scotch architecture, bought chiefly works of the Romantic School which had then reached recognition in France. The gathering of artists, upon the arrival at the gallery of a new picture by one of these artists, was described by Professor Mavor, of the University of Toronto, chairman of the joint committee of arrangements for this exhibition, in his address in opening the exhibition. Professor Mavor, who is well known as an experienced Art critic, passed his own youth in Glasgow and was at that time intimate with the Glasgow painters; so that he spoke from personal knowledge.

The inference in favor of the establishment of an Art Museum is obvious; and we recommend our Toronto readers to take this opportunity of seeing a really good exhibition of pictures, that they may taste the enjoyment and advantage of it, and see for themselves whether membership in the Toronto Art Museum is not a thing to be desired.

DECORATIVE PAINTING.

This subject—carried over in continuation of last month's notice of the Annual Exhibition of the Ontario Society of Artists—has the special interest that there is likely to be some decorative wall painting done soon in the entrance halls of the Parliament Buildings in Toronto.

Any arrangement of form or colour is decorative, if it is only an arrangement ; indeed there is some excuse for associating particularly with decoration a certain emptiness of idea, inasmuch as there is such a thing as decoration which consists in form and nothing else. For this reason no doubt the Ontario painters of decorative studies in landscape simplify their work as they do, excluding everything that may distract the eye from appreciation of the general arrangement of colour form which is the primary motive of the study.

It is this latter point—making decorative handling the equivalent of omission—that we should like to discuss with them. There is such a thing as leaving out because one is not able to put in and producing decorative pictures as a measure of prudence ; but that is not a phase of the matter that concerns us now. A chief example is in the work of a painter who has demonstrated both in easel work and a large way, many times, his capacity for decorative work of more than one kind, It is an idea adopted by choice, not a necessity of lack of skill ; and this article is a controversy rather than a criticism. The example in question was a pair of Canadian landscapes—the one farm land with barns in the middle distance ; the other a road retreating into the middle of the canvas, viewed from a bridge in the foreground, with houses on the left and a rail fence, trees etc. on the right. These paintings were framed heavily and simply in pine, stained brown, which showed them to be excellently adapted to fill large panels, over a mantel-piece or otherwise. On first sight, in taking a hasty look round the gallery to see what was best worth looking at, the writer was struck forcibly by these paintings and thought—"at last the poet of ever day Canadian scene!" But a return to them brought dissatisfaction ; and this not that what was done was not good, but that there was not enough done to give content. From whatever point of view—distant or near—definition was incomplete. Something like this may be the appearance of landscape to the short sighted man ; but we consider normal sight to be the standard, and the short sighted man himself supports us in that position to the extent of wearing glasses. Now on a clear, early summer day, such as these paintings seem to represent, anything that is seen in full daylight is seen distinctly ; too distinctly it is said ; but if that is a characteristic of the atmosphere in Canada, a Canadian country road can only look like itself when its details are thus defined.

It is at this point in the argument that the camera usually gets some uncomplimentary mention, but it is quite out of place. There is no proposal for complete representation ; it is proposed only that so far as it goes representation should be distinct.

When a recent pair of Sunlight Soap posters were on the hoardings, we had an excellent representation of little girls making child's play of wash day with a lace curtain and a tub of water in a meadow. What went to make it up ? Nothing but the figures, outlined and washed with local colour. No sky, no ground ; nothing else but the tub and curtain. Accurate and expressive outline-drawing of the simplest kind told the whole story. I should not myself have noticed how little there was in it but for hearing a question asked—why those children looked all right when they were standing on nothing.

If, in the lower walk of decorative art, it is possible to present a large range of idea by the selection of the poetic facts, and their definite expression, it cannot be the distinguishing mark of greater art to suggest vaguely and leave definiteness of idea to the mind of the beholder.

So far we have been speaking of the fantastic vagueness that would make nocturnes out of daylight and people a land of milky atmosphere with forms of two dimensions.

Perhaps the real nocturne—the whole family of twilight effects that exist in nature and should have pictorial existence as well—will be claimed by the decorator as peculiarly his own. Perhaps ; but not, one would say, in the field of serious effort.

If one thinks of all the great decorative painting one has seen, with a view to discovering in it what differentiates it from the *picture:*—the one quality that runs through all seems to be an avoidance of occasional or unusual effects of light, in favour of an academic lighting that attracts no attention to itself but serves merely to define the forms that are the subject matter of the composition. Even in pictures, when the theme is great, it is an impertinence to make the representation a vehicle for atmospheric effect. Therefore in decoration particularly, where, from Dutch tiles up, the principal concern is with form, and there are limits in other directions, all superabundance or dimness of light is discarded in favour of a clear, calm, almost shadowless illumination in which every form is distinctly seen.

BOOKS

CODE OF BUILDING LAWS. BY ALCIDE CHAUSSE, ARCHITECT. PUBLISHED BY THE [illegible] MONTREAL. [illegible] Bureau of Building Inspection of Montreal, Mr. Chaussé has given his chief attention to the Montreal Building Laws, which are clearly set forth in paragraphs under title headings, and these headings appear in the index so that the point conveyed by each paragraph may be easily looked up.

But the building laws of Montreal are not the only laws which affect building matters in Montreal. There are Provincial regulations respecting public buildings and industrial establishments, which Mr. Chaussé has extracted for his book ; and here he touches not only architects and builders and building owners in Montreal but a general public, throughout the Province of Quebec, which is engaged in industrial pursuits.

There is a section called *Extracts from the Code of Lower Canada* which gives common law in building matters. An example will show the kind of decision made:—"When the different storeys of a house belong to different proprietors, if their titles do not regulate the mode of repairing and building it must be done as follows: All the proprietors contribute to the main walls and the roof, each in proportion to the value of the storey which belongs to him; the proprietor of the first storey makes the stairs which lead to it; the proprietor of the second storey makes the stairs which lead from the first to his, and so on."

The book concludes with a dictionary of building terms and some tables and practical information useful for architects, builders and superintendents. Some of these are new or unusual; some, like the list of books

recommended for architects and builders, appear to be original compilations.

With the exception of the tables, the matter of the book, index and all, is given first in English and afterwards, in a second part, in French.

THE BUSINESS OF CONTRACTING, BY EARNEST MCCULLOUGH. PUBLISHED BY THE TECHNICAL BOOK AGENCY, P.O. BOX 691, CHICAGO. PRICE 50 CTS.—This is a small octavo paper book of 45 pages. The reviewer has read every word of it with interest and even fascination. It is written by one who knows his subject from personal experience. He appears to be an engineer who has been engaged in carrying out contractor's work. There is much practical advice about the management of a contractor's office and works. There is everything in method and much in machinery; but in the end it all comes down to men. The management of men is the contractor's business; and the interest of this book, and its value to contractors, lies in there being not only a full account of method but also full recognition that it can only be carried out by others; and the burden of the book is therefore the handling of men. It is a book that every contractor ought to read.

HOUSE HINTS FOR THOSE WHO BUY, IMPROVE OR RENT BY C. E. SCHERMERHORN. PUBLISHED BY THE HOUSE HINTS PUBLISHING CO., PHILADELPHIA. PAPER. PRICE 50 CTS.—There is a great deal of information and opinion about house building and furnishing packed in the fifty pages of this book. It is not explanatory so much as sententious. Brief opinions upon every point are given, mainly from the practical point of view, with reference to comfort and durability, but also from the point of view of taste. Each subject considered is paragraphed with a heading. The order of arrangement is that of the progress of a house from SITE to DRAPERIES, but the first page consists of an index in alphabetical order of the section headings, so that an opinion upon any one point can be readily found. The author's description of his work as "an earnest attempt to enlighten the house owning and acquiring public to a general correct knowledge of practical home building and [illegible] is [illegible] good account of its purpose. We have described his method; an extract given elsewhere will show the style of the book.

TRUSSED ROOFS AND ROOF TRUSSES BY F.E. KIDDER. NEW YORK. WILLIAM T. COMSTOCK. LARGE 8VO.; 292 PP.; 306 ILLUSTRATIONS. PRICE $3.00.—Mr. Kidd[illegible] are so well known that they need no commendation and little description. Those who already possess the first two parts of his series on Building Construction and Superintendence will understand the nature of this volume, which constitutes Part III.

The best possible description of the book is in the preface written by the author. He says, "the aim has been to describe nearly every type of roof construction commonly met with in buildings such as architects have occasion to design, to point out the advantages of the different types of wooden and steel trusses for different spans and building requirements and to explain the process of computing the loads, drawing the stress diagram and proportioning the members and joints to the stresses. Special pains have been taken to make the mechanical principles involved as plain as possible and to describe the method of obtaining the stress so that any intelligent person can apply them and that without violating any scientific principle".

What an architect principally likes to know is what has been done and it has been Mr. Kidder's method to show this, as the main subject of his discourse, with a running commentary upon its reasonableness and appearance. This is the method of the present work; enlightened, as he describes in the preface, by analyses of the different types and by illustrations, showing both general form and detailed construction. Copying trusses, except perhaps in the method of framing, is not good practice nor the intention of the author. Each truss must have its own computation. The last two chapters are concerned with this;—the one with the question of loads and their computation, the other with graphic statics and its application in making stress diagrams. This is the essential attainment for truss designing. The author thinks that any person of average intelligence can master the principles of graphic statics if he makes the necessary effort, and, these once mastered, the stresses in ordinary types of trusses can be easily and quickly determined.

CREMATORIA IN GREAT BRITAIN AND ABROAD BY ALBERT C. FREEMAN. LONDON, ST. BRIDE'S PRESS, 24 BRIDE LANE, FLEET ST., E.C.—The modern revival of cremation has a sanitary motive. According to Darwin's estimate, earthworms in one acre of ground will cast up 15 tons weight in a single year. Pasteur, acting on this hint, experimented with worms from earth in which animals that died of splenic fever had been buried and found that the earth they carried and earth which he obtained otherwise from beneath the surface were both full of the germs of the disease, and he was able to infect animals fatally from both specimens. That in brief is the case for cremation. Earth does not purify. Noxious gases rise from the soil and water that percolates through the soil is contaminated, when there is mere decay. Much more is there danger when the bacilli of specific disease are buried with the body. There is no certainty as to when the germ will die, if buried; cremation, on the other hand, surely destroys it. Herein is the reasonableness of the practice, and, however little we may like it, this we must admit.

Mr. Freeman's work is a study of the buildings that have been erected for the purpose since 1872, when a modern scientific process was made the subject of experiment in Italy and the results exhibited at the Vienna Exhibition in 1873. Mr. Andrew Taylor's crematorium in the Mount Royal Cemetery at Montreal comes in for a brief description. The illustrated examples are English, European and American. The English, to an English eye, contrive to get most of the usual feeling we are accustomed to in buildings connected with the disposal of the dead.

The crucial question is the method of obtaining rapid and complete incineration, consuming all gases and leaving nothing but the ashes of the body; and the most valuable part of Mr. Freeman's work is the description of the methods employed in the different crematoria he describes.

The coffin is generally placed on a catalalque in a chapel adjoining the incinerating chamber and, at the conclusion of the burial service, moved by mechanical means, without handling, through a door in the separating wall, into the furnace, where a heat of from 1500° to 2000° is obtained.

The painful part of the process is the long waiting upon the process of incineration; and not less unsatisfactory is the question that then arises as to the disposal of the ashes. The resulting ashes are remains not only of the body but of the coffin as well. To contain them a box urn measuring 8 in. by 8 in. by 16 in. is said to be necessary. The question is, what to do with it?

The practice at present is to build a columbarium, in connection with the crematorium, and there dispose of the urns in niches, as close together as possible, to make all possible use of the space, and holding "as many as ten urns in one niche." The price is given of the niches in the Fresh Ponds Crematory, New York; —"in the upper row all around the building $10 each, in the next row $15, and then $20 and $25.

The suggestion of such a building is of gloom unenlightened by sentiment. But how else to bestow the ashes? One would like to revert to the old order of things and bury the urn.

NAME.

"Well, the congregation have become so fashionable that they wont stand for the old name any longer. They want something modern."

"What will they call it?"

"I dont know, but I should think the Church of the Holy Limit would be about right."—*Puck.*

OUR ILLUSTRATIONS.

THE MOLSONS BANK, TORONTO BRANCH. MESSRS. FINLEY AND SPENCE, ARCHITECTS, MONTREAL.

This building is to be begun in May, on the corner of Bay Street and the lane which continues Pearl Street. The latter is at present a goods lane and in the drawing is gated off as if it is to continue to be a private road. The corner entrance is therefore without the usual *raison d' etre* of an approach from two directions and is evidently adopted only to face the point of principal view, which will be the corner of King and Bay Streets, almost exactly on the axial line of the entrance and the dome over it.

The lane side, which is pierced with windows to light the clerks' desks is kept quiet; ornament is concentrated on the entrance and front, where is the manager's room. There is to be a light well one storey deep in the centre of the building. The public space is below this and clerks' desks on the north side get their main light from above.

The upper storey is a residence.

THE HOME BANK OF CANADA, TORONTO. MR. BEAUMONT JARVIS, ARCHITECT, TORONTO.

For a single frontage like that of the Home Bank the greatest distinction is to be obtained from columns. The banks appear to have come to the fortunate decision that low buildings devoted principally to their own purposes make the proper type for a bank building. As they are surrounded by much taller buildings, the scale which is given by a single order of two or three storey height is desirable to enable them to hold their own in the street. The view of the Home Bank, or of the Yonge St. Branch of the Bank of Commerce, (illustrated in our February number), as one approaches them on the same side of the road is striking, and adds much to the liveliness of the street. This however determines the principle rather than the solution of it. One cannot help hankering after something founded on the proportions of the orders but not following them altogether in detail.

Here is a suggestion which at any rate opens up a way of some individual variation and will improve our universal rendering of the orders with an empty pediment. There is no Greek precedent for this. It was never intended that an order should be crowned by a plain pediment without sculpture. The pediment form itself is severe enough without being made a ground solely for the display of rectangular dentils and console ends. Sculpture in some form is demanded for the sake of its grace of line. And there is plenty of motive for its display in bank heraldry and titles, without it being necessary to revert to the affairs of the Lapithæ and Centaurs and other persons in whom we are but coldly interested, and who, not having the expense of clothes, had dealings with no bank but that on which the wild thyme grows.

The Home Bank is interesting as being of reinforced concrete throughout.

THE LINTON APARTMENTS, MONTREAL. MESSRS. FINLEY & SPENCE, ARCHITECTS, MONTREAL.

There is no mistaking the apartment house character of this building. The sparkling effect of the drawing will find expression, in the executed work, in the variegated surface of brick and stone, got by using quoins for every angle and by carrying through the head and sill courses. The wrought iron and glass at the entrance contribute to the appearance of elegant comfort.

The building is said to be without light shafts; for which purpose it appears, from the perspective, to have an H plan, which is the main motive of the design. The floors and partitions are of terra cotta; wood is used only for flooring, doors and trimming. Other features worth noting, in the description of the building in one of the Montreal newspapers, are the abundance of bathrooms; utilization of the basement for a heating and ventilating plant, as also for fire-proof store rooms for tenants' property and a garage for their motors; and cold storage closets in the pantries, so that no ice need be brought into the building.

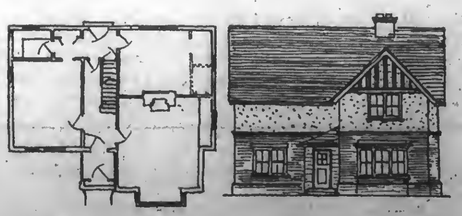
CANADIAN ARCHITECT AND BUILDER COMPETITION. DESIGN BY MR. VICTOR G. STEER, TORONTO; AWARDED THIRD PRIZE.

It is as a straight forward building plan, and at the same time convenient and pleasing in its arrangement, that this plan gets its position. It might be improved in execution by setting the east wall of the dining room two or three feet further out. There is no more walling involved and that room, which is very comfortably placed and will make a good living room, should have sufficient space.

The parlour, which stands between the dining room and the north wind, ought to have little window if any in the north wall; certainly not a mullioned sash-window as shown. A small casement, and high because of being in a wall close to the line of the lot, would have been more suitable for the problem before us, in which 40 feet was the specified width of the lot; but in any case, (supposing the adoption of the plan for actual building on another lot), it is not so much light that is wanted when there is so large a window at the end, as a cross draught in summer. For this purpose the small window might be well repeated in the rooms above. It should be remembered also that a room looks best when the main light comes from one direction only.

It would improve the exterior somewhat if the large roof were carried past the ridge of the small one, for a few feet, and finished with a small gable.

The truly satisfactory condition for the exterior would of course be to find a reason for making a projection on the north wall equal to the width of the dining room wing, so that the main roof would have to run through and the parlour wing become a projection upon it.



The reason might easily be found in a larger kitchen, and more interesting parlour, and space for closets for the bedrooms above.

These comments are made, not in criticism of Mr. Steer's plan, which fulfilled very well the conditions of the competition, but because one purpose of these competitions is to bring suggestions for suitable plans before those of our readers who build for themselves

in the smaller towns ; and the plan before us seems well adapted for a little expansion.

CATHEDRAL CHURCH OF ST. BONIFACE, ST. BONIEACE, MANITOBA.—MESSRS. MARCHAND & HASKELL, ARCHITECTS, MONTREAL.

Here is a design well worth attentive scrutiny, both for the interesting working out of the style in detail and, especially, for the dignity and nobility of the total result. The front—especially the entrance with its expanse of steps and the great seated angels at each end—has the true Catholic feeling, of the church of which the visible existence in the world is a real part of the order of things.

In plan there is evidently a nave and passage-aisles. The designers have profited by modern development in that direction. One could wish they had abandoned antiquity also in the truncation of the tower at the dome. Provencal examples minimized the brutality of their slicing by making the slope steep—extending it down to the point of emergence of the tower from the roof. They might have done more. Instead of merely negativing ugliness as far as possible, they might have left us a solution that had positive beauty. There was time for invention then.

WESTIMINSTER PALACE, FROM THE VICTORIA EMBANKMENT; FROM A PHOTOGRAPH BY MR. J. P. HODGINS, TORONTO.

From this point of view, where there is nothing to be seen but towers, we appreciate the value of the towers. The whole extent of the building is marked out for us by them. The pavilion marks the near angle of the river front, the clock tower and Victoria tower the opposite ends of the other front, and the lantern rises in the centre. From whatever point of view the building may be looked at [illegible] extent is never lost. The aerial perspective given by the London haze, (which is so well rendered in Mr. Hodgins' photograph,) gives full value to the distance between the two great towers. This is architectual design, and the largeness of its character has so much to do with the quality of these buildings that it ought to have more to do with the controversy that is now going on in England, as to whether Barry or Pugin should have the credit of the design. The large man was unquestionably Barry, and the internal and external scheme are great. Pugin is said to have detailed the work ; in which case England has not, as somebody said, "wasted her gift of Pugin." But there is one point in the detailing—the universality of the ornament—which affects the general character of the building—the point where the architect comes in ; and we have an utterance of Barry that may be matched with this ; a saying to the effect that ornament will not be excessive if it is appliedeverywhere.

HEATING AND VENTILATION OF ST. PAUL'S HOSPITAL, MONTREAL.

In a paper read before the Canadian Society of Civil Engineers, a double duct fan system of heating and ventilation is described with a novel air washer and humidifier. Those of our readers who have had experience with fans for heating and ventilation will be interested in the air filtering device to remove dust and add moisture to the entering air.

An ideal system of heating and ventilation should maintain a constant temperature and supply fresh air in large quantities at a proper humidity without dust or drafts. Almost every system of heating is designed to maintain a constant temperature, but very seldom is the humidity given consideration. It is not uncommon to find air in buildings very much drier than normal pure air, and an explanation is not difficult. Since air saturated at zero degrees will contain about one-half grain of moisture per cubic foot, and at 70 degrees one cubic foot will contain eight grains, it is clear that if air is heated from zero to 70 degrees the humidity at the higher temperature will be only 6 per cent., and the air will then be drier than the atmosphere of the Sahara Desert. This extreme dryness is very harmful to the mucous membrane of the human body, and it is in a large measure responsible for the prevalence of disease of the nose and throat in cold climates. It is also a noticeable fact that a high temperature is required if persons are to be comfortable with a low humidity. It is well known that a thermometer with moistened bulb will register a lower temperature than a dry bulb beside it, but it is not generally known that the sensation of heat and cold experienced by people varies rather with the registration of the wet bulb thermometer than with that of the dry bulb. It is a common error to assume that the dry bulb thermometer gives a true indication of the temperature felt by human beings, and to consider all contradictory evidence as due to the mutability of human nature. Roughly, it will be found that with 55 per cent. relative humidity a temperature of 64 degrees will be as comfortable as a temperature of over 70 degrees, with a relative humidity of 30 per cent. From an engineering standpoint, therefore, we come to the same conclusion as a physician, who, discussing this subject, states that: "So long as we continue to neglect the indoor relative humidity we shall continue to live in unhygienic surroundings, created by any method of heating that is not supplied with means for properly moistening the air. To do this should be as much the purpose of a scientifically constructed heating system as to furnish sufficient heat."

Any system of ventilation will necessarily add not only to the first cost of a heating equipment, but also to the operating expense. Heat is considered essential because the lack of it at once affects our comfort ; while breathing impure air, when one becomes accustomed to it, produces no immediate discomfort. Through ignorance of the fundamental principles much money has been wasted in the past on inefficient or defective methods of ventilation. It is, however, considered poor practice to-day to design a heating system without at the same time making provision for a positive supply of fresh air free from dust or soot, and furnished to a building without drafts in any room. In the State of Massachusetts a law has been in force for several years making it compulsory to supply 30 cubic feet of fresh air per head per minute in all schools and public buildings. The amount of air [illegible] different

Hospitals (ordinary)	35 to 40	cu. ft.	per min.	per person.
Hospitals (epidemic)	80	"	"	"
Workshops	25	"	"	"
Prisons	30	"	"	"
Theatres	20 to 30	"	"	"
Meeting halls	20	"	"	"
Schools per (child)	30	"	"	"
Schools per (adult)	40	"	"	"

Fresh air contains about 4 parts carbon dioxide in 10,000, and the presence of 6 to 8 parts in 10,000 is scarcely noticeable, but the presence of 11 parts in 10,000 is distinctly perceptible, and when higher percentages are found the air is sufficiently stale to be not only uncomfortable, but actually injurious. Since an adult breathes about 500 cubic inches of air per minute, and as respired air contains about 3.4 per cent. carbon dioxide, it is clear that approximately 17 cubic inches of carbon dioxide are exhaled per minute, and from this data the following table has been prepared :

Parts carbon dioxide in 10,000.	Cu. ft. of fresh air per min. per person.	Percentage respired air.
4	Infinite	0
5	100	.29
6	50	.58
7	33.3	.87
8	25	1.45
9	20	1.74
10	16.7	2.03
11	14.3	2.32

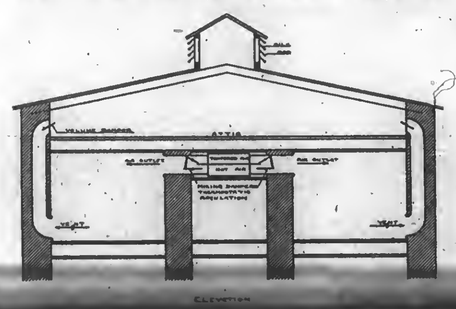
Common standards of good ventilation are taken as allowing between 6 and 8 parts of carbon dioxide to 10,000 parts of air, and a comparison of the two tables will show that they give about the same results. Allowance should be made for the size of the room and the period during which it is used at a time, for where there is a large space per capita, even if no fresh air is admitted, it will take some time for the air to become polluted.

With a system of forced ventilation there is a tendency to install small ducts, as the available space for ducts is generally limited, and by an increase of pressure the requisite amount of air may be delivered even with small ducts. It is a great mistake, however, to use a high

pressure, even though it be available, for at too high a velocity through the ducts a rush of air is distinctly audible, and air entering and leaving rooms at a high velocity will be certain to produce uncomfortable drafts. Some device for cleaning the air supplied is also necessary, for no matter where the inlet is placed there is bound to be mixed with the entering air some dust and soot.

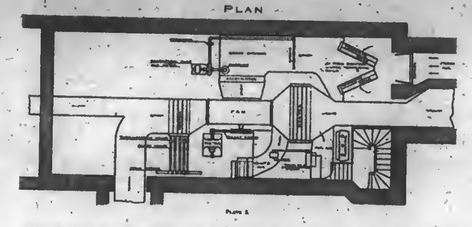
We should then aim to keep a constant temperature at a constant humidity, and to supply pure screened air in positive quantities without creating perceptible drafts.

The equipment at St. Paul's Hospital consists of a motor-driven fan ; tempering coils and heating coils, with their supply and return pipes ; ducts for distribution of air, with deflectors for adjustment and dampers for control ; thermostats for control of temperatures, and a combined air washer and humidifier for cleaning and moistening the air. The fan is a three-quarter housing steel plate, centrifugal with double discharge. It is driven by a direct-current motor by means of a chain drive. At full speed it delivers 45,000 cubic feet of air per minute, and by means of a rheostat in the field circuit of the motor two lower running speeds may be used. The coils are of the mitre type, which are usually employed for hot water, as the resistance to circulation is very low, and in this case they are used with low pressure steam for the same reason. Tempering coils are placed between the inlet and sprays to bring the air at least above freezing point. A temperature of 50 to 55 degrees is found necessary in the spray chamber, because the temperature in this chamber affects the humidity, and because some air by-passes the heating stack on the discharge side of the fan, and therefore goes to the rooms without a further increase of temperature. The distributing ducts beginning beyond each heating stack carry separately hot air, which passes through the heating coils, and tempered air, which goes above them. These ducts are kept separate until the mixing damper is reached, of which a detail is shown in Plate I. In each duct there is a balanced damper, and



the two are joined together by a link, so that when one is open the other is shut, and vice versa. Thus a constant volume of air is supplied at a temperature varying in such a way as to balance the heat losses from the building. In most rooms the dampers are controlled by thermostats, to give a constant temperature, but in some they are arranged for hand regulation.

The air washer and humidifier is shown in detail in Figure 1. It consists of a number of spray nozzles in a plane at right angles to the course of the air, and a box of baffle plates, which remove the dust and water carried mechanically. The sprays are shown clearly in the drawing, and require no further description, but there are several novel features in the "dry box" which need explanation. In the fan room of the hospital space is very valuable, for every foot is below the ground level, and excavation is expensive. If the cross-section of the dry box is to be reduced we must figure on a higher velocity of air in order to handle the same quantity. In this case a velocity of about 350 feet per minute is used, and the loss in friction is so small as to be almost negligible. Considering that each plate is but two inches long, and the total thickness of the box 12 inches, it seems impossible that the moistnre can be completely removed. A piece of dry paper placed behind the box at any point will show no trace of drops of water, however, nor is there any perceptible moisture on the last bend of the plates. The first bends are purposely left without projection to allow a film of water to form, and it is this film which collects most of the moisture and all dust or soot. The first projection prevents most of the film from being carried through, and the remaining projections remove thoroughly whatever water may remain. While we may depend upon the film to remove all water carried mechanically, the moisture carried by absorption is, on the contrary, increased to an amount dependent chiefly on the velocity of air through the plates. At any given running speed of the fan this velocity is constant, and the relative humidity of air leaving the baffle plates at full speed remains nearly constant at 80 per cent., independent of the relative humidity of the entering air. If the temperature of the spray chamber is kept at 55 degrees, each cubic foot will carry 80 per cent. of 4.85 grains, or 3.88 grainsof water, which will give a constant humidity of a little more than 55 per cent. when the air is warmed to 65 degrees. The temperature in the spray chamber is kept constant by a thermostat, which operates a by-pass damper below the tempering coils, admitting enough cold air to reduce the temperature as required. The air in the tempered air ducts will remain at 80 per cent. humidity, and the air in the hot air ducts will enter the room at a low relative humidity, but in either ducts 3.88 grains are carried by each cubic foot of air, which corresponds at 65 degrees to a humidity of 55 per cent., and if the rooms are kept at this temperature the humidity will be practically constant.



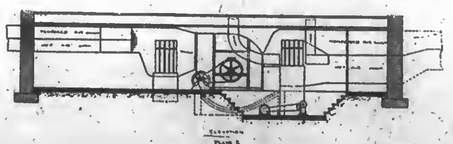
Both hot and tempered air ducts are made of galvanized iron of the following gauges :—

All pipes of less than 5 feet circumference, of No. 26 gauge ; 5 to 8 feet circumference, of No. 24 gauge ; 8 to 10 1-2 feet circumference, of No. 22 gauge ; 10 1-2 to 13 1-4 feet circumference, of No. 20 gauge ; 13 1-4 to 19 feet circumference, of No. 18 gauge ; above 19 feet circumference, of No. 16 gauge.

The cross-section at any point of the air ducts is designed to give a constant friction per foot of length, and each branch is designed to receive its proportionate supply, though the amount of air it receives will depend largely upon the angle at which it leaves the main duct, and at this point a deflector is installed to permit careful adjustment when taking anemometer test.

There are four separate buildings to be heated, and the ducts run through tunnels to three of them. Hot and tempered air are carried in separate ducts from the coils and by-pass until close to the opening into each room, where mixing dampers are located as shown in the plate. As soon as possible after passing the dampers a gradual increase of 50 per cent. in the area of the duct is made, which makes the velocity of air entering so low that there is no perceptible draft. No register faces are used, but the iron of the duct is [illegible] gives a neat appearance, and by doing away with registlow of air.

The vent flues all have dampers, which are, in most cases, kept partly closed to ensure a slight plenum in the rooms. All vent flues lead to the attic, in which there are two ventilating towers with moveable louvres. The louvres are made of a waterproof silk, with a rod at top



and bottom to keep its shape. The top rod is stationary in a frame, and the bottom rod is light enough to allow air to escape, but heavy enough to fall back in place if there is a tendency for air to enter.

It is noticeable that in such a ventilating system there are many adjustments to be made, but most of these are made when testing, and are then left permanently in a fixed position. After all deflectors are set no change can be made in the amount of air supplied except by varying the speed of the fan, and this can only be done from the switch-board. Thermostatic dampers in most rooms keep the temperature variation within one degree. Another set of thermostats placed in the fresh air inlet are adjusted to close off one coil of the heating stacks at 10 degrees above zero, a second at 20 degrees, and a third at 30 degrees. Similarly, one section of the tempering coils closes at 60 degrees. The temperature regulation is thus taken care of, and since, as already explained, the humidity is controlled automatically, the only attendance that is required is the occasional cleaning and oiling of motor, fan, and pumps.

THE MONTREAL BUILDERS' EXCHANGE.

Building Employers' Associations, or as they are now generally known under the title of "Builders' Exchanges," are no longer in the experimental stage. The need of such organizations has been amply demonstrated by their rapid spread throughout every building centre on this continent. They meet the commercial need of the busy contractor in forming the nucleus of a co-operative association, all ready to hand; they also offer the opportunity of a closer and more friendly approach to social intercourse between employers in the same or kindred lines of business, instead of eyeing each other askance as their worst enemies.

Yet in spite of these obvious advantages in mutual co-operation, the apathy of Canadian contractors on the whole is to say the least, remarkable, and it can be stated without serious contradiction that the value of association has scarcely begun to be appreciated, far less realiz-

Mr. N. T. Gagnon,
Past President Montreal Builders' Exchange.

ed, by the building employers of Montreal. It has been realized by the working classes, and every success they have had in improving wages and general conditions has been precisely in proportion to their loyalty to this principle of faithful co-operation. In every department of labor there is apparent even to the most casual spectator, a systematic and persistent determination to enforce co-operation and to effect solidarity of interests between all the various branches of labor organizations, and thus ultimately to capture and dominate the whole labor situation.

Whatever faults our American cousins may appear to have (and we have a few "glass-houses" here to remind us of a wise discrimination in throwing stones) they certainly have the virtues of enterprise and energy. They have been swift to appreciate the value of the tactics of the labor party in systematic organization, and to get together on matters of common interest; the large and flourishing Builders' Exchanges of Boston, New York, Philadelphia, Baltimore, Pittsburg, Buffalo and Cleveland are "living epistles" of what can be accomplished in this direction by determination and loyal co-operation, as contrasted with the "splendid isolation" affected too often by our own contractors.

The Builders' Exchange, of Montreal, had its origin in a meeting held at the Windsor Hotel, on 29th November, 1897, to discuss the desirability of forming such an institution. A representative gathering of leading firms in the building industry decided the question in the affirmative, and so the new-born institution was launched into the troubled waters of this mundane sphere.

A charter of incorporation was sought and obtained from the Quebec Legislature in June, 1899, and it is interesting to know that the original charter members—Messrs. Jas. Simpson, C. T. Williams, Peter Lyall, Amos Cowen, John Maclean, Frank Fournier and Walter P. Scott—are all with us yet as active members of the building fraternity. The first President was Mr. Jas. Simpson, followed in due order by Messrs. C. T. Williams, J. H. Hutchison and N. T. Gagnon. From a modest beginning of some thirty members the Exchange grew to 100 in its second year, and after undergoing the usual changes and chances of a somewhat chequered career, had reached its ebb-tide early in 1905. It was at this juncture that the Past President, Mr. N. T. Gagnon, took the helm, and with the support of other loyal members of the Exchange, determined on the appointment of a permanent Secretary and a general "forward" policy. This policy was amply justified by its successful results, and during the tenure of the secretaryship by its present occupant, Mr. J. H. Lauer, the membership has steadily risen to a higher level than ever before attained, with every indication of yet wider expansion, the only limit at present being its present quarters.

The Montreal Builders' Exchange desires to extend the scope of its usefulness in the future, and is well alive to the value of "Permanent Exhibits" to proprietors, architects and contractors alike. Additional space is the crying need of the Exchange just now to enable it to undertake this and other improvements, and the extreme values of real estate on St. James street will necessitate removal to a more reasonable locale; as soon as this can be accomplished the exhibition feature will not be long in becoming a "fait accompli."

J. H. Lauer,
Secretary.

There has been negotiations between the journeymen's union and Toronto master plumbers, the former asking an increase in wages from 35 cents per hour minimum to 40 cents. A large number of the masters have joined the Employers' Association in the absence of life in the old Master Plumbers' Association.

At a recent meeting of the Montreal Chambre de Commerce, the advisability of imposing a tax on United States contractors doing bnsiness in Canada was discussed. It was stated that Canadian contractors had to pay a tax in the United States. The matter was referred to the committee on industries and manufactures.

Mr. R. George Hood, President.

Mr. J. H. Lauer, Secretary.

Mr. Joseph O. Deslauriers, Vice-President.

Mr. John Duthie, Director.

Mr. Joseph Thibeault, Director.

Mr. W. E. Ramsay, Director.

Mr. J. N. Arcand, Director.

Mr. W. B. Shaw, Director.

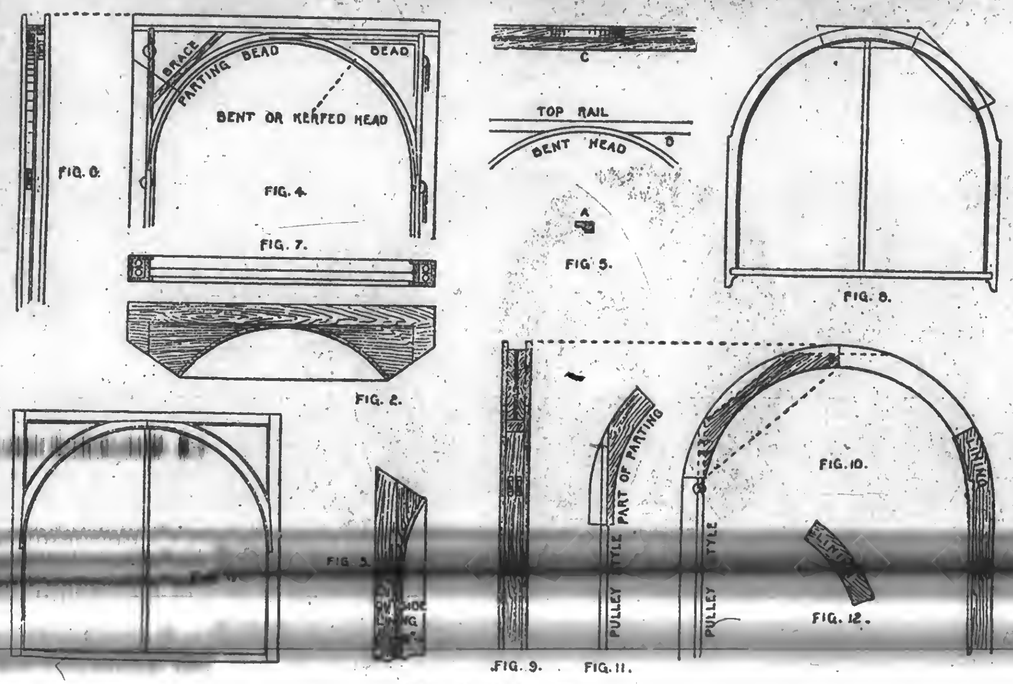
Mr. Alex Bremner, Director.

OFFICERS AND DIRECTORS OF THE MONTREAL BUILDERS' EXCHANGE.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

A "Correspondent" asks: Will you, through the columns of The Architect and Builder, kindly advise as to the best method to be employed to make a Keens cement smooth finished dado (such as done in bath rooms), appear as tile, as to joints, and the best manner of making them, and are there any special tools for such work, if so where can they be obtained, or can the work while in its green state be marked with a pencil and be durable? Any information in regard to the foregoing will be greatly appreciated.



CIRCULAR HEADED SASHES.

Ans.—Keens or any of the white cements, owing to the suction of the walls, have a tendency to shrink more or less, according to the stiffness of the gauge and the suction, and therefore must be floated and run in twice. When the coat already laid on is firm, then some more cement, gauged softer than the first, should be laid thinly all over and floated in carefully as before. Having done all this, the whole surface is nearly ready for scouring. Miller, who is an authority on matters of this kind, says Keens Cement should be allowed to stand an hour or two after being floated before being scoured or rubbed down. If the finger cannot make an impression upon it easily, it is quite firm enough to scour. Use as little as possible water and work the hand float with a circular motion. Do not work too long in one spot, but keep moving all over the surface within reach, and working back again until the whole surface has an even texture and grain. The work should be gone over twice to bring it up to a fine solid surface. When the surface has to be polished, the work by the trowel must be followed by a nine-inch joint rule and a damp brush, but this work must not be attempted until the surface is hard. The work may be lined off before it "sets" completely hard by using a straight edge and a small V tool. This tool is something like a carver's tool, but is bent so as to do the cutting as it is drawn towards the operator. It should have an adjustable guard on it that can be fastened to it in such a manner as will prevent the tool from cutting in too deeply. Bricklayers jointers only finer are sometimes employed in forming these joints. After the tiling is all marked off and lined, the whole surface may be moistened slightly, and a thin mixture of Portland cement—neat—colored to suit may be rubbed into the joints, and the face of the work cleaned off with a damp cloth. When fairly dry the whole may be cleaned off and polished in the usual manner either with rotten stone and water or oil, or by any of the numerous methods of polishing marbles or cement surfaces. An exceedingly good piece of work can be turned out, if the workman does his duty with care and skill. A good background or first coat, is a necessity for work of this kind, and it is suggested that cement mortar be used for the first coat. Any, or all the tools required to do this work should be obtainable at any first-class hardware store in the country.

From "Superintendent."—My work calls me to figure the cubical contents of thousands of cars annually, and I would like to know if you have a book of some kind with tables whereby I could lessen my work. Length of cars would be 27-0 to to 40-0, width 8-0 to 9-6 and height 2-0 to 3-6. If so, kindly state particulars and price?

Ans.—Any good work on mensuration should give good rules for obtaining the cubic contents of the cars inentioned. You will find first "The Canadian Contractor's Handbook and Estimator," a very useful book in matters of this kind, also "Hudson's Modern Estimator," in which rules are given for cubing work of any kind. From these books, a table could easily be computed that would serve the purposes of our correspondent. These book may be obtained from the office prepaid for $1.50 each.

From Novice.—Will you kindly show by diagrams how window frames and sashes are made with circular heads outside, and square ones inside, also how the sashes are made with regular circular tops or heads?

Ans.—It would take much more space than we can afford to describe fully all you ask for. However, we will give a short description, also show a few diagrams, that will no doubt be of use to you. Referring to the diagrams we have:

Semicircular-headed Sashes and Frames. Fig. 1—The appearance given by means of sash, an ordinary frame being used with linings shown at Fig. 2 and 3. Fig. 2—Outside top lining for dit- outside appearance of semicircular top; upper sash has semicircular top. Fig. 5—Connection of bent head and top rail—A, section; B, elevation; C, plan. Fig. 6—Elevation of inner surface of pulley style. Fig. 7—Plan of sash frame. Fig. 8—Sash for semicircularing headed frame. Fig. 9—Outside of arch: Elevation showing back of pulley style. Fig. 10—Elevation of arch with parts of construction exposed. Fig. 11—Part of parting. Fig. 12—Part of lining.

Then: (1) An ordinary frame with suitable outer lining. A sash frame consists of a sill, often made of oak, two pull pulley styles, a top rail, a set of three each outer and inner linings, parting beads, generally ⅞ in. thick, and outer beads, commonly ⅝ in. by ⅞ in., with parting strips, wedges, etc., which are concealed inside. Though these will not be described, it is hoped that their places and use will be sufficiently indicated in the drawings. Now, it is obvious that an ordinary sash is fitted with an upper sash like Fig. 1, it would become necessary to make the outer linings like Figs. 2 and 3, and then the outer appearance desired would be secured. The sash would require the chief alteration. This consists of the two added rails placed diagonally in the upper corners, and having their edges cut to the required curve and the moulding worked in the same pattern as the styles. The moulding and rebate can be made with those iron spokeshaves made for the purpose, if one can be found to agree with the moulding-plane used for the straight work. Failing this, in painted work the moulding can be worked on a piece of straight-grained oak or mahogany, and cut off neatly, so that it can be bent, glued, and beaded to the curved rails, forming at one operation both moulding and rebate. If this is well done and the joints in the added moulding not coincident with the other joints, it will make a very fair job. The whole of the inside moulding might with advantage be in one piece, and the joints of the added rails in the corners should be made as in the drawing before the frame is glued up. Of course, another method would be adopted in shops where a spindle-moulding machine forms a part of the plant. In this plan no alteration is required in the position of the sash pulleys or in the method of fitting the beads.

(2) The next modification is that of fitting into the top of frame an arched rail. This may be cut in segments, bent in layers round a drum, and glued up, or cut out of two solid pieces, or bent by the aid of kerfing, with or without a veneer glued on; or, in fact, by any of the methods used to produce a curved rail. The rail need only be a trifle thicker than the sash, for the outer linings shown in Fig. 2 and 3, together with the parting beads (which are also shown at 2 and 3 in the part up to the lines, and shaded darker) are affixed outside the curved rail, and very much add to its strength.

The straight top rail should be cut away equal to the thickness of the added curve rail where the and 5. Fig 4 shows the frame without the linings, and Fig. 5 the connection of the straight and curved top rail. Fig. 6 shows the side view of frame, with the position of the sash pulleys, which in this frame is different to that just described. The pulley styles, which should not be less than 1¼ in. thick, ought also to be notched to fit the curved rail, as shown in Fig. 7 as well as in Fig. 4.

(3) In the semicircular-headed frame and sash, more than anything that has been described, circumstances alter cases, and nothing we write here is to be taken as specific, but only as suggestive. If you have in hand a specially dry piece of stuff of thickness equal to width of the pulley styles, and have appliances suitable for making the groove for parting. These explanations, along with the diagrams, seem to be all that is required for an understanding of the subject.

Options have been secured on several valuable gypsum properties in Hagersville, Ont., by Mr. J. T. Mullaney and Mr. M. A. Reeb of Buffalo, N. Y. It is proposed to establish a large crushing mill and refinery in the vicinity of the Grand Trunk Railway station at a cost of about $50,000.

MONTREAL NOTES.

Several circumstances have combined of late to bring the office of City Building Inspector prominently before the public. When on the 3rd of April a newly erected water tank on the top of a building in St. Paul Street collapsed, resulting in the death of a young woman employed in the building, many indignant protests were heard on all sides regarding the looseness with which such operations were controlled. A little previously another tank had collapsed in somewhat similar circumstances, though without any fatal effects. Two such accidents within a few days make a strong appeal for public control. If care for their own reputation and for the lives and properties of their employers is not sufficient to compel constructors to make safe their work, then the civic authorities may very well be expected to step in. The Building Inspector, when appealed to in the matter, points out that his department consists of himself and one assistant; and it is obvious that a department of this size cannot be expected to keep touch with all operations, including the construction of buildings, and the installation of sprinkler and other plant therein; to calculate the strain on every stick and stone which builders propose to employ, and finally to see that, when rightly calculated, the members of structures are according to all the calculations and requirements of the case. In connection with the tank trouble, the Builders' Exchange has come forward with the suggestion that the erection and inspection of these tanks should be undertaken somewhat on the lines of boiler inspection, and this may be the right and proper solution of this particular difficulty; but it does not touch the general weakness of the present state of affairs, which leaves it till some such tragedy as the present has occurred before there is any reasonable chance of proper precautions being observed or compelled in such cases.

Another matter in this connection that has been much before us lately is the question of dark rooms in dwelling houses. It is stated that houses with rooms that have no direct communication with the outer air are being erected by hundreds. If in such an important and obvious matter as this the l[illegible] hope can we have that in lesser matters the poorer class of tenants are given a chance for healthy living. We pass by-laws prohibiting spitting on the sidewalk, and at the same time permit consumption and other mortal diseases to be forced upon the poor man by the airless rooms he must rent. Again, the Building Inspector points to the extent of his staff, and to the fact that fire risks and not sanitation are his special department. There is a Health Department to which he reports cases of unsanitary arrangement. The civic health officer declares he can take no action because the by-laws only demand that "habitable" rooms be properly ventilated, and the city attorneys' interpret "habitable" as meaning "actually inhabited." Meanwhile in all ordinary rational walks of life "habitable" can only mean "capable of being inhabited," and the difference of interpretation is responsible for the ill-health and premature death of hundreds.

Now towards the efficient inspection and care of buildings there is one very obvious initial step which, simple as it is, would go a long way towards improving the present unsatisfactory state of things. This is the deposition at the Building Inspector's office of plans of all buildings about to be erected or altered. Considering how often this has been advocated by individuals, by the Province of Quebec Association of Architects, and by the Building Inspector himself, it seems amazing that it has never been put in force. According to the present system plans are expected to be approved by the Building Inspector at sight. They are not left in his hands. Nothing more than a most superficial inspection is possible. The plans not being in his safekeeping are not available to him to refer to at short notice, and they are liable to be lost or destroyed at any time. Any system of inspection which claims to be thorough must surely have some tangible basis to work from. To have all plans carefully under review would mean that the Building Inspector would have an opportunity to give deliberate consideration to novel features, such as the construction of overroof sprinkler tanks or anything else; and competent officials could be called in to pass upon them. Opportunity would be given to architects or builders presenting plans to have their attention called to by-laws, greater or less, old or new, which they might have deliberately or inadvertently been about to transgress. The systematic operation of such a system would naturally tend to more thorough and general acquaintance with and observance of the city's by-laws. With copies of all plans in their possession, the civic authorities would be in a position to form some idea of the scope and requirements of an inspector's department and to employ a staff capable of overtaking all the duties.

The Builders' Exchange, of Montreal, are taking steps with a view to establishing greater uniformity of practice in regard to methods of obtaining tenders and of making out conditions of contract. There can be little doubt that a uniform form of contract for the generality of work could be drawn up in such a way as to meet with general acceptance both by architects and builders. In the matter of obtaining tenders, however, there exists such divergence of practice and of sentiment, in regard to many points, that it will be difficult to introduce uniform rules. This, however, is probably a good reason for making the endeavor. The sooner the discussion of the subject is undertaken, the sooner will a satisfactory practice be arrived at. A sub-committee of the Province of Quebec Association of Architects has [illegible] confer with representatives of the Builders Exchange on the subject.

At the twenty-third spring exhibition of pictures held in the Art Gallery, in Philip Square, from March 23rd to April 14th, the exhibit of architectural drawings seemed this year to be rather smaller than it was last year. The principal position was given to a pleasant water color drawing of the Nurses Home at the Royal Victoria Hospital, by Messrs. Ed. and W. S. Maxwell. The building maintains the Scottish Baronial style of the hospital buildings, with a little less severity of aspect. Prof. Nobbs exhibits sketches of three pleasant little houses and a drawing of the interior of the lounging room of the McGill University Students' Union. As drawings these all possess something of the combination of crispness and tenderness that is the special beauty of water color work. Messrs. Finley and Spence show five large drawings of different buildings. Besides some that have been referred to before in these notes, they represent the Molson's Bank, Toronto, and the Federal Life Assurance Co's. premises, Hamilton. Most of these drawings are signed J. Fitzpatrick, and look solid and faithful renderings of the buildings. Messrs. Saxe and Archibald entered the competitive drawings for Emmanuel Congregational Church, which, in black and white wash, looks ghostly amongst the surrounding color.

The same firm have a colored elevation of a store for Messrs. Robinson & Co., which exhibits a quaint originality of treatment. The tone of red brick suggested is not quite happy—the less so as there is nothing to suggest joints or agreeable surface texture. Messrs. Ross & Macfarlane have two drawings—a design for a new library at Bishop's College School, Lennoxville, and the new office building for the Dominion Guarantee Co.—pleasant drawings in black and white, with a faint suggestion of color. Messrs. Castle & Son send three designs for interiors, which suffer from the huge scale on which they are drawn. They might look well at a greater distance than it is possible to get in the little room where they hang. Mr. Louis Farey has four designs for interior treatments. Those that follow on the historical styles, though not in all cases in strict accord with history, are pleasing and compare favorably with the more original design for an ingle-nook. Mr. Mitchell has some careful sketches of Melrose Abbey. Mr. Rickson A. Outhet has a couple of garden designs—the one in perspective is pleasantly treated, but the garden paths, being white, can hardly be true to reality, and the circumstances impoverish the effect of the drawing.

THE SKETCH CLUB OF THE P. Q. A. A.

On the 14th of March, Prof. C. W. Colby, of the chair of history at McGill University, gave a lecture before the above Club, taking as his subject "Brunelleschi." The lecturer illustrated the remarkable character of this grave and gentle Florentine, who turned the stream of architecture into the renascence channels which had been in part prepared for it by the general change of sentiment and study of the age. Trained at first, like so many of the great artists of the period, in the workshop of a goldsmith, Brunelleschi tried one art after another without distinguished success. Foreseeing that the problem of covering with a dome the great cathedral then rising in the midst of Florence, would require a knowledge and resource no architect in the city then possessed, he sold his small estate and journeyed to Rome to study night and day, in order that when the hour should come the man should not be wanting. After fourteen years unremitting study in Rome, he returned to Florence when the question of the dome was being agitated. He alone could speak with confidence in the matter. Envy, greed and mistrust barred his way; but that course that the master had set, when he started for Rome so many years before, he was to steer successfully to the end. The dome was a triumph and is the glory of the Florentines. On the slab that marks Brunelleschi's place of rest in the cathedral is the simple inscription "Philippus, Architector." "Philip," for one name suffices for the great and well beloved; and in the shadow of that great dome he is "the architect."

On the 21st of March, Mr. Lemasnie spoke on the subject of "The Composition of Natural and Conventional Forms." By the medium of sketches on the blackboard, Mr. Lemasnie illustrated the simple lines which form the basis of ornamental design, tracing the same underlying principles in the conventional forms of architecture and in the animate forms of nature. In conclusion, he strongly recommended the study of plant life and other phases of nature, as a means of infusing freshness and enjoyment into our ideas of design.

On March 28th, Mr. Pollard reviewed the work

HAND HAMMERED LEAF WORK

OF ANY DESIGN IN IRON, BRASS OR COPPER

Our Facilities for Turning Out Work of this kind are Unsurpassed. Write for Estimates.

CANADA FOUNDRY CO., Limited

Head Office and Works: TORONTO, ONT.

District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

of Mrs. Edith Wharton on "Italian Villas and Their Gardens," calling attention to the excellent appreciation of architectural effects in which the work abounds, and also, incidentally, to the excellent illustrations by Maxfield Parrish.

CORRESPONDENCE.

To the Editor "The Canadian Architect and Builder" :

For the benefit of brother architects, and twenty-six in particular, the writer wishes to call attention of the profession to the urgent need of a more thorough understanding and united action in regard to competitions.

While it must be acknowledged that the award in a majority of cases is open to criticism, yet we are solely to blame for the conditions of unjust competitions, which are due to faulty proposals accepted by the architects competing.

A certain city called for competitive plans for a City Hall to cost $60,000, naming the accommodation desired, but did not bind themselves to accept any plan; neither did they agree to employ an expert to advise with them in the selection of plans.

Upon plans being submitted (twenty-six in number) it was found that the amount mentioned was not sufficient, and plans were returned to the competitors with a note, saying it had been found that none of the plans submitted could be built for the amount stipulated, and that the Council had determined to increase the amount to $100,000, and inviting the architects to amend their plans accordingly.

Sixteen sets of plans were submitted on the second appeal, and it is now where the mistake occurs; the plans were placed on public exhibition, before the award was made, thereby inviting public comment, criticism, and a natural inclination to guess who were the authors of the various plans.

The Council called in an expert to advise with them as to the probable cost of a design they had selected. He reported the cost to be $169,000. (This was before final specifications were written.) This report should have disqualified the plan in question. The Council entered into correspondence with the architect, and asked him to submit working drawings and procure tenders, notifying him, at the same time, if his building exceeded $100,000 in cost, that they were to be at no expense.

Result :—Tenders called for; lowest tender, $108,000 average tender is $130,000.

Now for the unfairness of the deal: The general conditions as drawn up by the Council explicitly state that the finish shall be of hardwood throughout, brick shall cost $40 per M. The basement walls were to be laid up in hard burned brick in Portland cement mortar; but the architect whose plans were accepted, having proposed a building containing 675,840 cubic feet, found it inconvenient to carry out these conditions and still retain his original plans, so he violated the self-imposed conditions at will, skims his building of its just rights, and produces a specification that gives a building to cost 16 cents per cubic foot.

The Council in accepting these plans have violated their own conditions and rules knowingly. I say this advisedly, for their attention has been called to this matter by the local architects, as well as by architects from outside.

Initiators of competitions rarely impose conditions wilfully, but ignorantly, and most frequently because they find members of the profession—well educated men of reputation—eager to make and present drawings with or without conditions. The character of the programme, no matter how faulty, is no bar to the zeal with which members of our profession work day and night, expending energy and brain power, on elaborate drawings, without any reason to expect, or even hope, that the best scheme or the most artistic design, will be the one adopted.

He who promises the impossible usually secures the work, while a design that could be honestly carried out for the amount named is seldom considered.

How many doctors, dentists, lawyers, or artists would enter a "free" competition, and submit a prescription, set of teeth, brief, or portrait, to be judged by a committee of non-professionals, and returned with or without a "thank-you" if their work did not please? What class of men in these professions would enter such a race? Would their services be desirable?

Apparently the committee thought they were complimenting the architects by allowing them an opportunity to display their wares.

For the benefit of those architects who competed, the writer will say that in his opinion there were at least five sets of plans submitted that were infinitely more imposing in both design and plan than those selected by the Council, and which could be built for the price mentioned and in compliance with the general conditions as laid down by the Council in question.

The Standard Ideal Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QUALITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTATION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

Among the plans submitted, and which appealed to the writer, were those entered under the nom de plume of Victoria, Winterott, Ormande, Craftsman, and Arenco.

The cost of producing the drawings in this case are considerable; twenty-six at the first call and sixteen at the second; forty-two plans at an average cost of $100 is not too high a price to assume, thus the architects have wasted $4,500 without the slightest assurance of even a square deal.

The object of a competition should be to secure the most skilled architect, as shown by the scheme which he presents.

An architectural adviser should draw up the programme and advise the owner in relation to technical questions in making the programme, selecting the scheme and the architect.

The amount to be expended on the work should be sufficient, within a reasonable margin, to erect a structure of the character and size indicated in the programme, or there should be no cost stipulated.

The programme should be in the nature of a contract, which guarantees the employment of the successful competitor to make the drawings for and supervise the work of the proposed structure at a proper remuneration.

Payment sufficient to cover the preparation of the drawings demanded of competitors in limited competitions, and prizes, or premiums in open competitions, to cover such expense for at least the five best schemes should be guaranteed.

Sincerely yours,
W. W. LACHANCE, Architect.

Regina, Sask., Feb. 20th.

This letter should have appeared last month but for want of room.—Ed.

NOTES.

We regret to record the death at Hamilton of the wife of William Stewart, Architect, of that city.

The Northwest Electric Company, Calgary and Edmonton, has just finished the wiring of the new Penitentiary at Edmonton.

W. M. Dodd Architect, of Calgary, Alta, has opened up a branch office at Edmonton. This office is under the management of Mr. P. J. Ross.

The Mechanics' Supply Company, Quebec; H. McLaren & Company, Montreal; The Vulcan Iron Works, Winnipeg, and Boyd, Burns & Company, Vancouver, have become agents for the Taylor-Forbes Co., Guelph.

Mr. Jeremiah Sears, the oldest painter in Toronto, has been [illegible] accompanied by that of a bank book in which a substantial deposit had been entered to his credit. Mr. Sears was born in 1823, at Maidstone, Kent, England. He is active and hearty and still pursues his calling.

The Superior Portland Cement Company, of Orangeville, Ont are busy installing their plant, which they expect to be running this summer. When completed the plant will be one of the most up-to-date in Canada, and will be capable of turning out close on 1600 barrels of cement a day. Owing to the close proximity of the marl and clay beds from which they will draw their raw material, the company are in a very advantageous position, and have excellent prospects before them.

The Standard Sanitary Manufacturing Company, of Pittsburg, Pa., manufacturers of the "Standard" porcelain enameled baths and sanitary goods, will this year erect a large modern plant at East Camden, New Jersey, for the manufacture of these goods. The factory will be designed upon a most elaborate scale and will cost approximately $500,000. A full line will be manufactured, including the various types of bath-tubs in all designs, lavatories in the different designs and sizes, sinks and laundry trays, drinking fountains and other articles used in plumbing and sanitary installation.

Allis-Chalmers-Bullock, Limited, under new management, have leased a suite of offices in the new Traders Bank building, Toronto.

The Convention of Master House Painters and Decorators of Canada will be held at Windsor on July 24-25-26 and from present appearances promises to be the most successful meeting of Master Painters that has ever taken place in Canada yet. Leisure time will be put in on the beautiful waters of Lake St. Clair and the Detroit river, so that the occasion will be made a pleasant outing.

We have the most perfect fitting LOCK-JOINT COLUMN made. Write for Catalogue and prices.

DETROIT COLUMN & MANUFACTURING CO.
The largest and most extensive Manufacturers and Shippers of COLUMNS AND COMPOSITION CAPITALS in the United States. Write for prices and discounts.
DETROIT MICHIGAN

Style No. 27 Style No. 22½

WE FURNISH COLUMNS IN ANY SIZE OR LENGTH

STEARNS
BILLING VISIBLE
TYPEWRITER

Manifold-Gauze Carbon Paper
Royal Paragon Typewriter Ribbons
Cantype Spring Frame Duplicators
Stencil Paper and Inks

CANADIAN TYPEWRITER CO.,
119 St. Francois Xavier Street, MONTREAL
68 Victoria Street, TORONTO

HARDWOOD FLOORING - End matched, bored, polished and bundled
SIEMON BROS., LTD.
Office: 82 Confederation Life Bldg., TORONTO
Our Prices will Interest You
WIARTON, ONT.

INTERIOR MARBLE WORK

J. G. GIBSON MARBLE CO.
TORONTO

CRUSHED MARBLE FOR TERRAZO FLOORS

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
38 ALLIANCE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	JOHN E. BELCHER, Peterborough
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR—

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. E. VANIER, "
TREASURER	J. E. GARDINER, "

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS W. SELF, 1st Vice-President.
C. W. BATY, 2nd Vice-President.
JAS. CRANG, Treasurer.
H. MARTIN.
THOS. CHRISTIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO. WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 47 English St.
J. JONES.
CHAS. GOULD.
T. WRIGHT.
H. STRATFOLD.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADLEY
C. P. SHINDLER
K. M. FRASER
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

G. W. MURRAY, President. A. E. PORTER, Secretary.
A. T. DAVIDSON, 1st Vice-President. T. D. ROBINSON, Treasurer.
G BURGEAULT, 2nd Vice-President. ALEXANDER IRWIN, Sergeant-at-Arms
Directors: T. G. Latimer, R. Cass, P. Powell, M. B. Martinson, D. Cameron, V. L. Bouche, Wm. Alsip, C. H. Simpson, Jas. A. Payne, T. W. Morley, Thos. Cotter, T. A. Gloin.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.
JOS. O. DESLAURIERS, Vice-President.
J. HERBERT LAUER, Secretary.
N. T. GAGNON, Past President.
W. E. RAMSAY.
W. B. SHAW.
J. LEFEBVRE.
JOHN DUTHIE.
JOHN L. HARRINGTON.
JOHN GRAY.
ALEX. BREMNER.
J. N. ARCAND.
JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, Jr., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATNIEU.
H. CONTANT.
E z COTE
LOUIS PAYETTE.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new Pullman with all latest innovations for travel comfort, leaves Chicago 10.05 P. M. daily, arrives Los Angeles 4.45 P. M. third day via Chicago, Union Pacific & North-Western Line and the Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to the general agent or address, B. H. Bennett, 2 East King Street, Toronto, Ont.

[illegible] Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

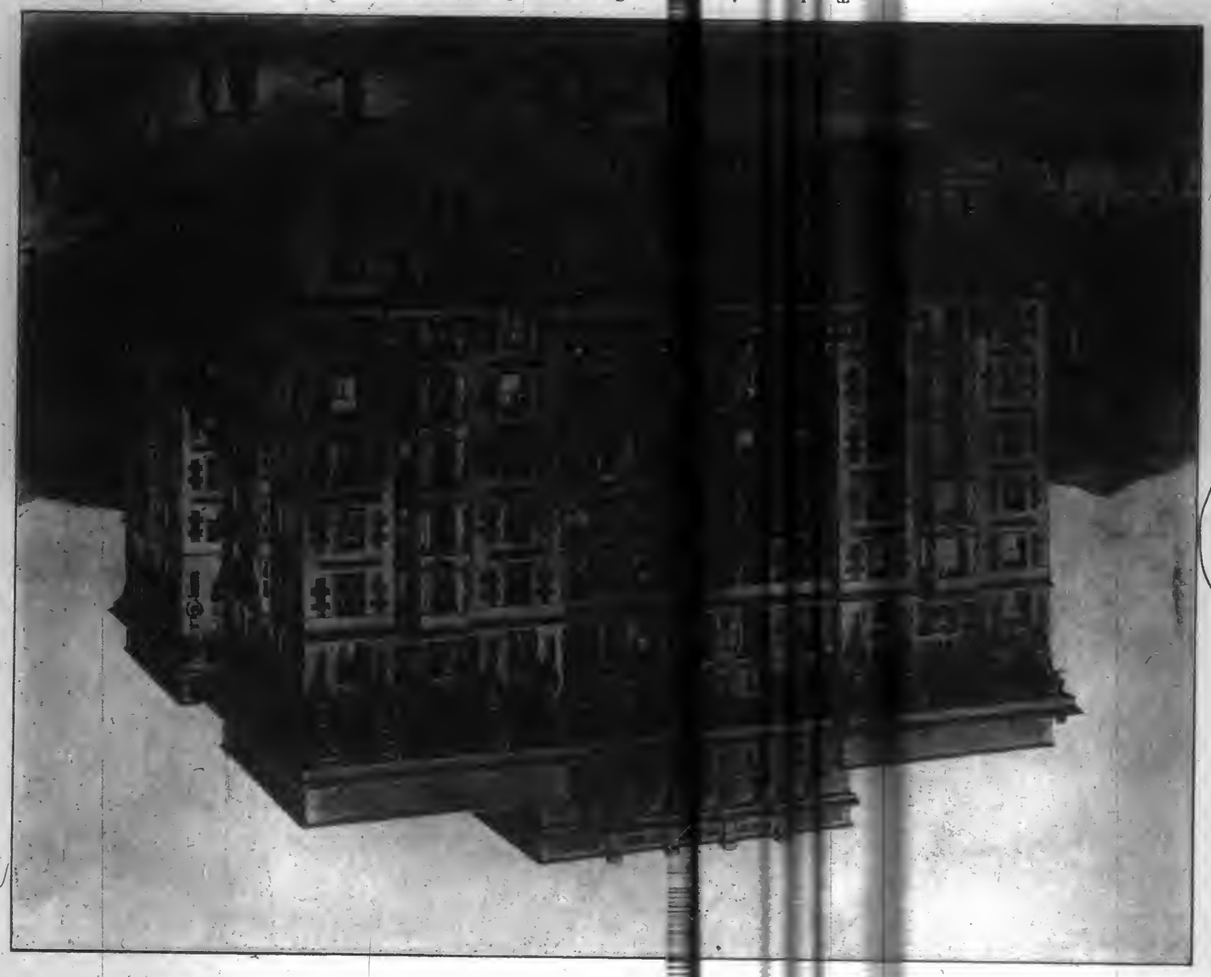
HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

THE LINTON APARTMENTS, SHERBROOKE ST., MONTREAL.

MESSRS. FINLAYSON & SPENCE, ARCHITECTS, MONTREAL.

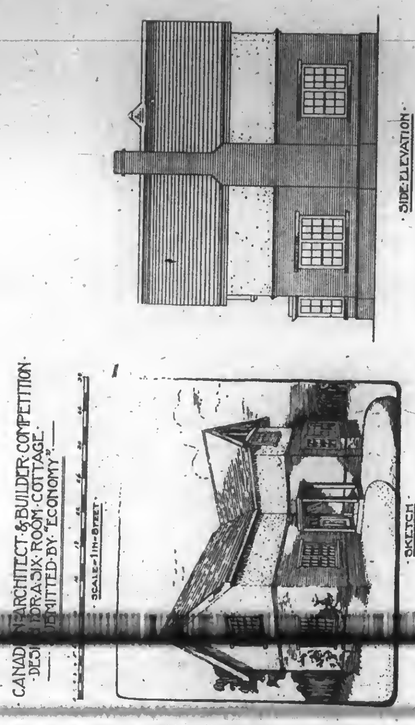


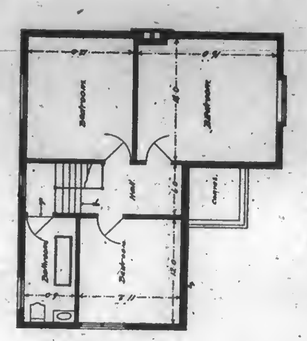
THE HOME BANK OF CANADA.

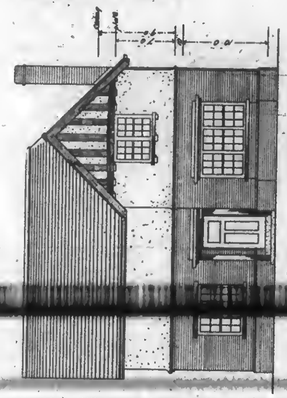
HEAD OFFICE, TORONTO.

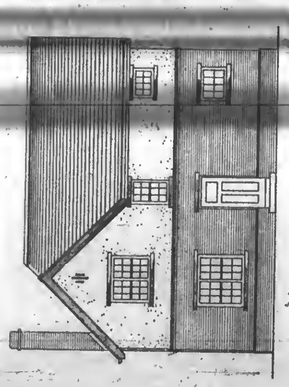
MR. BEAUMONT JARVIS, ARCHITECT, TORONTO.

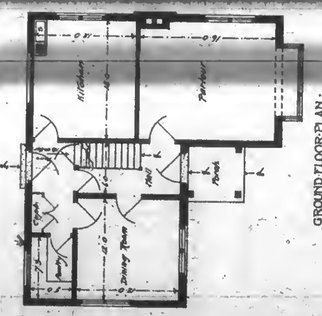
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1908.











"THE CANADIAN ARCHITECT AND BUILDER" COMPETITION FOR A HOUSE OF SMALL COST IN A COUNTRY TOWN.

DESIGN BY MR. VICTOR G. STEER, AWARDED THIRD PRIZE.

CANADIAN ARCHITECT & BUILDER COMPETITION.
DESIGN FOR A BRICK ROOM COTTAGE.
SUBMITTED BY "ECONOMY."

SCALE 1/16 = 1 FOOT

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1908

THE MOLSONS BANK, TORONTO.

MESSRS. FINLEY & SPENCE, ARCHITECTS, MONTREAL.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
APRIL, 1906

The Canadian Architect and Builder

C. H. Mortimer Publishing Company - - - Publishers.
W. A. Langton - - - - - - - Editor.
Offices: Confederation Life Building, Toronto, Canada.

Vol XIX.—No. 221. May, 1906.

ILLUSTRATIONS ON SHEETS.

Parsonage for the Metropolitan (Methodist) Church, Toronto.—Messrs. Sproatt & Rolph, Architects, and S. Q. Curry, Consulting Architect, Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

The Dominion Bank, Branch on the corner of Bloor and Bathurst Streets, Toronto.—Mr. Eden Smith, Architect, Toronto.
The Federal Life Building, Hamilton.—Messrs. Finley & Spence, Architects, Montreal.

CONTENTS

Editorial	65	Intercommunication	74-75
Mr. Charles P. Baillairge	66	Montreal Notes	76
Earthquakes and Earthquake Proof Buildings	67	A New Architects' Association	78
Our Illustrations	68	Concerning Dry Rot	78
Mining Asbestos or Mineral Wool	69-70	Blueprint Specifications	79
Royal Institute of British Architects	71	Painters and Decorators	ix
The Toronto Builders' Exchange	72-73	The Labor Situation	xiv

Power from Windmills.

A means has been found of utilizing windmills as a means of producing electricity. The cause of failure hitherto, has been in the attempt to obtain electricity directly from the wind-power; the variability of the power has proved to be beyond control. Mr. R. W. Wilson of Westfield, Ind., has contrived to utilize windmills to give a steady application of power without diverting them from their proper function of pumping water. The water is his agent for the application of power. It is pumped up first to a reservoir into which it may flow regularly or irregularly as the wind serves. The exit from the reservoir is under control by automatic valves, so as to apply power from the head of water as it is wanted. The apparatus runs itself. As storage for some days is possible, there is nothing to prevent farm's and workshops in the country being lighted and even run by electricity every day, in still as well as in windy weather; and, in the case of the farm, it may be a by-product, if the water is necessary for irrigation and other farm purposes. It is obvious that the use of wind-power as a remote agent instead of an immediate agent in the production of eletrical power is capable of solution in other ways. Mr. Wilson's application of the windmill amounts to more than a new application; it is a new idea. The use of intermittent forces like wind-power and wave-power is understood to be awaiting the development of electrical storage. Mr. Wilson's invention amounts to the introduction of an ntermediate agent capable of storage. And there are other storable agencies in use in mechanics that it may be possible to apply on a large scale to take the place of water when its supply or disposal is not convenient.

Steam from the Earth.

Another invention is promised by persons who are spoken of as "scientists of high position." This is the use of the earth's internal heat as a source of industrial power. There is but little variation in the degree of heat found at the same depth in different localities. A comparison of underground temperatures has been made and a theoretical increase of one degree for every sixty feet has been determined. The boiling point should therefore be reached at about 12720 feet. The proposition is to bore two holes, about fifty feet apart, to a depth sufficient to reach a temperature of 240°; then lower charges of dynamite to the bottom of each hole and explode them until communication is established by fissures in the rock between the lower ends of the holes. These fissures will form an irregular but capacious caldron. All that remains is to supply water by one hole and apply the steam which will come from the other. The steam will have no divided inclination, with a water pressure of several thousand pounds to the square inch bearing upon it at the bottom of the supply hole.

A determination to put this idea into practice would

probably give an unexpected turn to the affairs of certain desert regions where great heat seems to be attainable at much less than the average distance below the surface. The Yellowstone Valley will break forth, not precisely into singing but into humming—with the hum of industrious machinery.

Draughtsmen enough in San Francisco.

The Secretary of the San Francisco Architectural Club has written to the Secretary of the Toronto Architectural Eighteen Club saying that a rumour that has gone abroad about the urgent need of architects and draughtsmen in San Francisco is without cause. The letter says that there are at present over 350 certified architects in and about the vicinity of San Francisco and over 1000 draughtsmen. Mayor Schmitz's proclamation sent to the mayors of other cities, asking for mechanics, architects and architectural draughtsmen before food or money, is perhaps the source of the rumour alluded to in this letter. There seems to have been a tendency to a rush of draughtsmen in response. Seventy were willing to go from Boston, but by the action of the Boston Society of Architects this number was reduced to eighteen, selected for general usefulness. If other towns responded proportionally in numbers and without the same judicious influence for selection there is good reason for the San Francisco Architectural Club to issue a warning.

One does not quite see of what avail, for rebuilding San Francisco, as it ought to be rebuilt and as it is likely to be rebuilt, an army of draughtsmen will be, unless accompanied by architects. It is a splendid chance of course for the draughtsmen to enter the train at Chicago as draughtsmen and come out architects at San Francisco. But it is only in competitions that we expect perfect work to come from unknown young men than from recognized leaders of the profession. Ordinarily in art, which is longer than life, age has an advantage; and in the architectural army at San Francisco there will have to be a fair proportion of colonels.

Architects do not float about so easily as draughtsmen, but, on the other hand, it is not necessary for them to do so. The work seeks the architect nowadays and a New York architect does not need to leave New York in order to carry on building in San Francisco. No doubt, when definite aim has taken the place of general intention at San Francisco, the architects of the east will be applied to for plans of the more important buildings and they will open branch offices in San Francisco in charge of representatives who will participate in and help to officer the general work of rebuilding.

MR. CHARLES P. BAILLAIRGE.

By the death of Mr. Charles P. Baillairgé, at his residence in Quebec, the profession of architecture has lost a very distinguished member, whose recognition was not confined to his own country. Mr. Baillairgé had the energetic and inventive mind that gives eminence in any walk of life, but his mathematical and scientific attainments made him a constructive architect *par excellence*. He had the proper combination of original thought and technical skill, and worked with freedom and facility.

At the time of his death Mr. Baillargé was in his eightieth year. He was born in Quebec on Sep. 27, 1826. He was educated at the Quebec Seminary. He was admitted as a P.L.S., 1847, and at once entered upon a successful career. Among the best known of his works as an architect are the Laval University, the asylums and churches of the Sisters of Charity and Good Shepherd, the Music Hall, the new jail, Dufferin Terrace, the aqueduct bridge over the St. Charles, and the "Monument des Braves de 1760," all in the city of Quebec. In 1863-65 he was associated with Messrs. Fuller and Page as joint architect and engineer in the construction of the Parliament Buildings at Ottawa. He was for many years hydrographical surveyor and engineer to the Quebec harbour commission and was at one time a member of the Quebec City Council. In 1866 he was appointed City Engineer of Quebec and in that position planned many important works and buildings.

In the midst of a busy professional life, during which his services were also frequently required in ar-

THE LATE MR. CHARLES P. BAILLAIRGE.

bitrations by both the local and federal governments by the courts, and by private concerns, Mr. Baillargé found time to write and deliver numerous lectures on such subjects as "Steam and the Steam Engine," "Pneumatics," "Mechanics," "Optics," "Astronomy, &c. While occupied in the construction of the Parliament Buildings at Ottawa, he completed a treatise in French on "Plane and Spherical Geometry and Trigonometry" with mathematical tables. In 1874 he published in French and English his "Key to the Stereometrical Tableau." This system was taught in the elementary schools in Russia and was subsequently applied to all the polytechnic schools of the Russian Empire. He was called to France in 1874 and received the gold medal of the "Societé de Vulgarisation de l'Enseignement en France," also the medal called "Phillippe de Girard," given for the most useful invention or discovery of the year. Subsequent to this distinction Mr. Baillairgé received 13 medals of honour and 17 diplomas from France, Italy, Russia, England, Brazil, Japan, Belgium, Canada and the United States.

Mr. Baillairgé was appointed, by the Marquis of Lorne, a member of the Royal Academy of Arts and, a fellow of the Royal Society of Canada. He was an hon. M. A. of Laval University; a Chevalier of the order of St. Sauveur of Italy, and an hon. member of various learned societies throughout the world. He was one of the original members of the Society of Canadian Civil Engineers, and was an early president of the Province of Quebec Association of Architects. He was twice married; in 1845 to the step-daughter of the late Hon. G. F. Duval, Chief Justice of Lower Canada; and in 1879 to the daughter of Capt. Benjamin Wilson R. N. His son has succeeded him as city engineer of Quebec.

EARTHQUAKES AND EARTHQUAKE-PROOF BUILDINGS.

By William F. Scott.

A match will start a flame that will light a cigar. This same flame will light a city into an unquenchable blaze if the conditions of fuel and air supply are favorable and the provisions for fire protection unfavorable.

In the recent San Francisco catastrophe we have a case where the fuel was the wooden buildings and the air supply that ever present draught through the Golden Gate. The earthquake supplied the match and incidentally destroyed the water supply for fire protection, which under the most favorable conditions was not of the best on account of the steep hills throughout the city. This great western port of the United States was a wooden city, the exceptions where wood did not prevail consisting of a comparatively small percentage of buildings in the business section. The "Native Son" always gave as the reason for this fact that buildings of wood were safe against earthquake shocks and because of the [illegible] redwood were insured against a great conflagration.

That their faith in wood has been "shaken" and will be transferred to steel or steel concrete is the lesson written in the ashes of this catastrophe. The fire swept over an area of about seven square miles and of the buildings in this burned district the modern steel frame structure stood out in grand contrast to all other types. They even stood the test better than might be expected because few of them were built in any way different from the conventional Chicago-New York Steel Skeleton which was designed to resist static loads and wind pressure only, and in which such strains as would be caused by an earthquake tremor were not considered. The cumulative resistance in the joints of these steel frames was undoubtedly a great factor in helping them to withstand the recent earthquake shocks, but to make this function positive the joints should be specially designed for the forces they must resist. Certainly reinforcement of this sort would add greatly to the power of the building to retain its enclosing materials from displacement.

That the steel frames stood the test is more than can be said of their covering or rather of the methods of binding the enclosing materials to their skeleton. The manner in which the brickwork between the steel framing of the tower of the magnificent City Hall fell in ruins about it is a good illustration of a vital point in the design of the conventional skeleton construction when applied to buildings that are to resist the strains of an earthquake shock. This tower was built on a steel skeleton frame well braced in the circumferential framing but not provided with steel bracing in the vertical radial planes. The walls of the main building and colonnade which formed the architectural base of the tower were of ordinary masonry construction and served the purpose of bracing the steel in the radial planes, thus when these walls were disturbed by the earthquake shock the tower was free to oscillate, which in turn caused the displacement of the spandrel filling between the steel framing.

The tremors of an earthquake pass over the face of the globe as waves in the fluid earth. They are more complicated than the waves of the ocean but their effect upon a building is analogous to that produced upon a boat at sea. There is a vertical and a horizontal force in the motions of these waves, therefore, if a building is to safely ride them it should be built with the same continuity and rigidity of frame as is obtained in the great ocean liner of to day which, considered structurally, may be likened to a pair of huge curved plate girders braced transversely with trusses and gusset portals. The ideal earthquake-proof building, then, should be, figuratively speaking, an ocean liner on end with the stern supported on a sufficient base of concrete and with the windows built in the same manner as are the port holes of the ship. But the architect is not permitted to make such radical departures from the conventional types of buildings. He must have square windows and pierce one-third his walls upon which he must write the alphabet of historic architecture. The ideal, therefore, is impossible, but a compromise between the ideal and the common type of skeleton construction is practicable.

It is beyond the scope of a short article to enter into details as to just what such a compromise would be; these details would vary with the individuality of every engineer who attacked the problem. However, I would premise three certain and fundamental requirements that must be considered in these details:

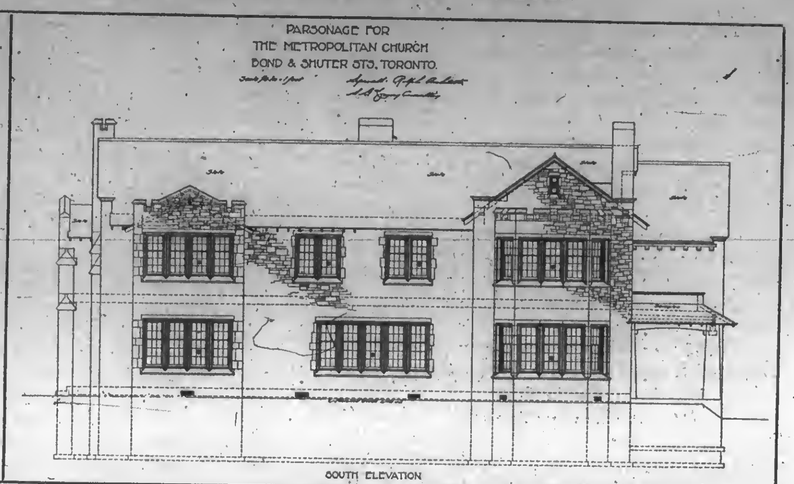
(1) There must be a rigid connection between the columns and girders of the skeleton frame but flexibility must not be sacrificed to rigidity.

(2) There must be continuity in the foundation for the skeleton.—The writer is of the opinion that the principle of construction of the "lighter" should be kept in mind for these foundations.

(3) There must be a comprehensive method of binding the enclosing masonry with a view to making it an integral part of the skeleton.

Steel-concrete and steel were mentioned above as competitors for place in the faith of future earthquake-proof builders. The developments in this method of construction are comparatively recent chronologically speaking, but there is no doubt that reinforced concrete will be an important factor in the development of these buildings. earthquake-proof building we have said must have continuity and rigidity of frame and must withstand severe shocks. The driving of reinforced concrete piles 35 or 40 feet in length without any shattering proves that the resistance of this material to shocks is very great; and as for the continuity and rigidity of this form of construction there is no more ideal method of obtaining both. It is just a question of placing sufficient reinforcing material where it will perform these functions.

OUR ILLUSTRATIONS



PARSONAGE FOR THE METROPOLITAN CHURCH, TORONTO. MESSRS. SPROATT AND ROLPH, ARCHITECTS, AND S. G. CURRY CONSULTING ARCHITECT, TORONTO.

The Metropolitan Methodist Church occupies the centre of an entire block of land; and, though a very large building, there is room in any one of the corners of the lot for a large house like this parsonage. As the Queen street cars run along the south side of the grounds and the Church street cars run on the east, the only quiet corner is the northwest. It is fortunate that this was the available corner for it allows every room of the parsonage to take its proper position with reference to the points of the compass and to have at the same time the most suitable disposition upon the grounds. The entrance, library and waiting room are in touch with Bond St. on the west; the kitchen entrance and yard with Shuter St. on the north; the living room and dining room are south and east and on the interior of the lot. The library, living room, and dining room get a clear look out to the south for the whole depth of the block; for the east line of the house is exactly on the west line—the porch line—of

With this general account of the disposition of the building on the ground we may leave our readers to study the plan for themselves.

As the donor has enabled the work to be carried out thoroughly in stone, including the yard wall, the work will have the substantial appearance that a house so far down town should have.

Our cuts on the illustration sheets are reduced as nearly as possible to a scale of 8 feet to an inch, and the south elevation shown above is half that scale—16 feet to an inch.

DOMINION BANK, BRANCH ON CORNER OF BATHURST AND BLOOR STREETS, TORONTO. MR. EDEN SMITH, ARCHITECT, TORONTO.

We have procured photographs of this bank building, (which does not seem to have received as much notice as it deserves), in order to illustrate a point of view, which seems to us a good one, for the treatment of branch banks. The bank occupies the corner of the ground floor. There is a residential flat above, with a small shop—a branch bakery store—under the oriel of the flat. These parts are suitably differentiated in the design, as may be seen, and the bank seems to have precisely the amount and style of distinction that it should have to suit its locality. The design, based on the present development of the Renascence, (as they call it now), in England is distinctly of our own generation and nationality. Its flexibility in the hands of an original designer is well shown in this bank in which dignity and domesticity are harmonized without apparent effort.

THE FEDERAL LIFE ASSURANCE BUILDING; HAMILTON, ONT. MESSRS. FINLEY & SPENCE, ARCHITECTS; MONTREAL.

This is a steel frame building with terra cotta protection. The two base stories will be faced solidly with granite; the cornice storey will be terra cotta.

The entrance on Main street admits to a large vestibule from which open the Company's office on the right hand, and a banking office on the left. The general office of the Company, for the public and for clerks, is on the eighth or top storey. This office will be lighted both by windows and by a domed ceiling 25 feet high. On this floor are also the offices of the superintendent of agents, the chief accountant and the actuary. The seventh storey is occupied by the manager, the secretary, the solicitor and the medical director and examiners; and here will be a large board room handsomely furnished and panelled in mahogany.

The stairs ar[illegible] leading thes[illegible] reached either from the vestibule, which opens upon a hallway 13 feet wide, or, more directly, by the James street entrance, which is opposite to the elevators.

The five intermediate floors will be divided into offices for rent.

On the ground floor the ceiling will be 18 feet high; in the Company's offices at the top the ceilings will be 14 feet high; and they will be 11 feet high in the intermediate storeys.

Externally the building is distinctly expressive of the class of commercial building to which it belongs. A certain freedom is desirable in the handling of buildings which are not set up for monuments so much as for advertisements. Here the severely classic, if one may say so, is not in perfect taste. It has the crudeness of imperfect culture. It is a case for free enrichment. And if the enrichment is done with taste, as it seems to be in the example before us, it is the proper way to escape the monotony of book-renaissance and give our buildings both the touch of the individual designer and the touch of our own generation. The building before us has the merit of distinctly belonging to our own generation.

Paris spends $100,000 a year to keep her trees in order and to plant new ones. Every street of a certain width is entitled to a row of trees on either side; while every street of a certain width has a double row.

MINING ASBESTOS, OR MINERAL WOOL.*

By Aubrey Fullerton.

Known to some extent in ancient Greece and Egypt, the existence and uses of asbestos seem afterward to have been forgotten until quite recent years. The revival dates from about the beginning of the last century, when mines were opened in Northern Italy.

Fiberized Asbestos Ready for the Market.

Since 1866 the Italian mines have been the chief source of supply in Europe, and until twenty-five years ago they were the only mines in the world. At the present time, however, asbestos is being mined in varying quaotities in Russia, Australia, and Africa, and most largely of all in America. It occurs in some nine or ten of the States, of which Georgia produces the largest quantity and Vermont the highest grades. The veins thus far discovered in the latter state are closely similar in character to those north of the international boundary, where, in the Province of Quebec, is the world's chief storehouse of asbestos. Of the grades suitable for the highest class of manufacture—which, in other words, means the grades suitable for spinning and weaving—Quebec has practically a world monopoly.

What makes one variety of asbestos of greater commercial value than another, and one country's deposits better than those of some other country, is the [illegible] of the

Asbestos in Raw State, as Taken from Mine.

based the divisions of the natural stone into two quite distinct classes. It is amphibole or actinolite when its crystals occur in long, slender prisms or in radiating masses, whose fibers are harsh and brittle, and whose composition is about 60 per cent. silica and 25 per cent. magnesia; it is chrysolite or serpentine asbestos when its fibers are long, slender, flexible, and easily separable into fine, silky threads that are highly elastic and capable of being spun. Quebec's supply, which is the source of the bulk of the asbestos used in the United States, is of this kind.

Chrysolite, the asbestos of the finer commerce, is in chemical terms a hydrous silicate of magnesia. The Canadian fiber, which is made especially soft and silky by its large percentage of water—over thirteen per cent.—is practically the same as the best Italian fiber; but Italy's supply of chrysolite is small, and so far as known this form of asbestos exists in paying quantities only in Canada.

Geologically it is a fibrous form of serpentine, occurring in strata of crystalline limestone. The serpentine—or verd antique marble, as it is popularly called—is a of greenish color; and the asbestos itself, which is found in small veins or layers, is light yellow or light green, and highly transparent. The veins run in an average thickness of from one-quarter to one-half inch, but sometimes of three, four and even six inches. Since the fiber runs crosswise, the thickness of the vein

Quarry of King Brothers' Asbestos Mine, Thetford, Que.

means also the [illegible] finer and more workable is the asbestos.

How this remarkable substance ever came to exist, is a question whose answer dates back to Creation times. Briefly the theory is this: The original rock, thrown up by igneous action, developed cracks and seams as it cooled; and as these rocks changed under the action of water and vapors to serpentine, the seams gradually filled with serpentine deposits from the rock walls in a fibrous structure. The asbestos fibres are, as nearly as possible, crystals of serpentine; hence their inconsumability.

The ore is mined mostly in open quarries. Overlying soil, to a thickness of sometimes twenty or thirty feet, but quite often forming only a thin layer on top, has first to be removed; and as soon as the asbestos veins are thus laid bare, the actual quarrying operations may begin. The rock is cut in a series of terraces, reaching a total depth of sometimes 150 or 200 feet. Underground work has not proved successful, the open quarry having been found both more economical and more effective, despite the disadvantages of exposure to the weather. Drilling and blasting are employed much the same as in ordinary stone quarrying.

When the rock is thus broken up it is rough sorted

---

*Extracted from the Technical World Magazine.

at the quarry. Two or more grades are selected according to the length of the fiber and are then sent on to the "cobbing sheds", where the further process of dressing goes on. This process is merely the separation of the asbestos fibers from the dead rock, and is done in some cases by hand but to an increasing extent by machine. Hand-cobbing is the very simple method of breaking the stone by small sledge hammers, throwing the fiber into one box and the waste into another. This separation is ordinarily not difficult, since the fiber lies in layers more or less loosely clinging to the rock, and can frequently be picked off with the fingers. The crude fiber, thus separated as cleanly as possible from the waste rock, and looking very much like mineralized wool, is packed in 100-pound bags, in which form it goes to the market and the manufacturer.

Hand dressing is not, however, an absolutely thorough method. The waste material from the cobbing tables, and the fine pickings from the quarries, have still some fiber in them; and the utilization of this frequently represents the largest profits of the mine. All these finer pickings are mechanically dressed. In case the asbestos contains a large percentage of water, the moisture is first dried out, by exposure to the air, by steam pipes, or by rotary driers; and the rock is then passed on to the crushers, where it is broken by successively finer-set rolls. Cylindrical fiberizers and the cyclone machine reduce it still further. The latter is the most effective apparatus yet devised for asbestos separation. It consists of two beaters, of the screw propeller type, driven within a cast iron chamber at a violent speed, reducing the particles of stone almost to a powder. This is then passed over a shaking screen to remove the sand; and in some mills strong electric magnets are used to take up the particles of iron.

The natural qualities of the asbestos ore vary considerably in different localities, and methods of treatment vary accordingly. The general principles, however, are essentially the same. Of the total rock mined in the Canadian areas, from 30 to 60 per cent. is suitable for milling, the percentage of waste having been greatly reduced by the introduction of mechanical dressing; and of the rock sent to the mill from 6 to 10 per cent. is fiber. Each ton of asbestos mined and milled costs about $17.50; and the market price runs from $25 for the poorest grades, suitable for paper and mill-board, to $200 for the best commercial grades.

When the dressed asbestos finally reaches the market, the uses to which it is put are almost unlimited, and depend entirely upon the length and quality of the fiber. The very fine fibers—those produced by the mechanical fiberizers from the tailings and waste heaps—are manufactured into various pulp and powder forms. As a fine powder, they are made up into fireproof paints, which are widely used for rough woodwork and possess quite remarkable fire-resisting qualities. As sold to the consumer, these paints are ready for use with the addition of water. Very fine fiber, of the best quality and thoroughly cleaned, is also of great value as a filter medium, the more so because it is proof against the action of acids and alkalies.

Fine-ground asbestos has often been experimented with as a stock for paper. As far back as 1866, some ingenious Italians attempted to produce a paper which they hoped would be adopted by the Government for securities and bank notes, but their experiments were not successful. Later and more satisfactory experiments were made in Paris and elsewhere, and a fair grade of asbestos paper has been produced. Its chief drawback is that it will not take a good sizing, remaining much like blotting paper; and while it is itself quite fireproof [illegible] under a severe fire test.

Asbestos millboard, resembling in character and method of manufacture the ordinary wood-pulp cardboard, is already a commercial success. The fiber mixed with water is thoroughly beaten in large tanks; then ingredients that will bind the fiber together are added, and the pulp in this condition is passed over a wire cylinder, through which the water is drained off. The residue of pulp thus gathering on the wire forms the board, which is then pressed, cut, and dried like ordinary paper board. This asbestos millboard is used for box material, such as for fireproof deed boxes, etc., and more particularly as a joint packing for steam pipes.

Another of the paper forms in which the poorer grades of asbestos fiber are very widely used, is that of roofing material. Some varieties of this are made with a canvas center and asbestos felt or paper on either side, giving a fabric that is not only fireproof but of great durability. A later invention comes from Austria, where the very fine fiber is ground with a mixture of serpentine, then with ashpalt and other ingredients. This process is now being introduced in the United States. Asbestos wall plaster is a similar production, also composed of fine fiber mixed with serpentine. It is applicable wherever plastering of any kind is required; and as it supplies its own fibers and rock dust, neither hair nor sand is necessary. It is being used in a large number of the new fire-proof buildings. Indeed, an asbestos building, from cellar to roof, may soon be possible, for recent experiements in fireproof bricks, composed of asbestos lime and sand, have been very successful, the bricks so resisting a 2,000-degree temperature as to be no more than slightly warmed. Floor tilings are a recent novelty now being made in Georgia.

Panoramic View of Asbestos Mines of the H. W. Johns-Manville Company at Danville, Quebec.

But perhaps the form in which asbestos is best known to the American building and engineering trades is in the several varieties of insulating material. As a covering for steam pipes and boilers, it is in use in nearly every modern office building in the country. In this capacity it serves the threefold purpose of saving fuel, increasing power, and reducing temperature. Ordinary uncovered two-inch pipes, with steam at 75 pounds, will lose one horse-power for every 132 feet of their length; and four-inch pipe, a like loss for every 75 feet. Ten square feet of bare pipe will waste in one year two tons of coal. Asbestos pipe-coverings pre-

Moulding Covering for Steam Pipe.

the best modern buildings call for every inch of their pipes to be covered. A fifteen-story building now going up in Toronto will have eight miles of asbestos pipe-covering; the United States battleship Oregon has seven and a-half miles on its boilers and steam pipes; and other buildings and ships of all kinds and types have corresponding quantities. In electrical installations, asbestos preparations are found similarly useful for insulating wires and for preventing overheating in electrical machinery.

This insulation of steam pipes is effected by applying a paste of asbestos fiber and magnesia to the surface of the pipe and binding it with canvas or oilcloth, or by fitting the pipes with sectional coverings, ready-made in various sizes, and bound with iron or brass bands. The latter covering is constructed of layers of plain and corrugated asbestos felt, whose numerous air-cells effectually prevent radiation.

With the better grades of asbestos fiber, still more remarkable results are obtainable. The fiber that we use in our gas grates, furnishing a very pleasant and powerful heat as the burning gas rises through it, is a fair specimen of the better qualities after being milled, but still unmanufactured. The highest excellence of the fiber consists in its fitness for spinning. For this, only the longest fibers are suitable, and they are best when softest and most elastic.

An important use of asbestos cloth is in the manufacture of theatre curtains. The value of such curtain has been repeatedly proven; and after the Iroquois Theatre disaster in Chicago, the demand for them and similar fireproof material was for a time especially active. Asbestos cloth is also made up into firemen's uniforms, consisting of boots, pants, aprons, gloves, mask, and head-gear. One or two men in each company, thus clad, can effectively do work that would otherwise be impossible. Iron workers and glass moulders wear aprons of asbestos cloth as a protection from the severe heat in which they work.

In America the increasing use of asbestos packing and pipe-coverings, particularly for office buildings and factories, furnishes a demand for the shorter fiber; in Europe, where building conditions are somewhat different, there is a much smaller market for these preparations, and a correspondingly greater demand for the spun and woven wares. In the manufacture of the latter, particularly in the English and French mills, the fiber from the mines of Italy and Russia is mixed with Canadian fiber, the combined product having for some purposes a superiority over either alone. Much the largest part of the Canadian output, however, is used in the United States and Canada. The mines in the Quebec district are operated by some ten companies, in which United States capital is largely interested. The ore is milled in Canada and shipped in fiberized form to the manufactories in New York, Pennsylvania, and elsewhere, where it is made up into the finished commercial wares. One of the earliest companies to operate in the Canadian areas, and the first to introduce mechanical dressing, was a company of Scotch capitalists; and a considerable portion of the output still goes to Scotland and England. German capital is also interested. The annual production of the Quebec mines alone is about 50,000 tons.

[illegible] of the best grades of asbestos, and in presumably inexhaustible supply, the neighboring Province of Ontario has considerable deposits of the kindred mineral, actinolite, or hornblende asbestos. Actinolite is very similar to the chrysolite asbestos in its chemical characteristics, and is equally effective in heat-resisting, but it is not so good a non-conductor and lacks in strength of fiber. It is used to some extent in roofing material and plaster. The essential difference between the two varieties is that, while chrysolite is a hydrous silicate of magnesia, the hornblende asbestos is an anhydrous silicate of lime and magnesia, and therefore without the softness and oily feel which characterize the better grade.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The headquarters for Canada of the Royal Institute of British Architects of London, England, has been moved from Montreal to Toronto, and Mr. F. S. Baker, F. R. I. B. A., Mail building, has been appointed Honorary Secretary for Canada.

An examination for admission to the Associateship of the Institute will be held in Toronto from the 16th to 23rd of November, 1906, and candidates who are British subjects and not less than 25 years of age will be eligible.

THE TORONTO BUILDERS' EXCHANGE.

The Toronto Builders' Exchange may be said to have originated from the old General Builders' Society, which was established in 1867; at a later date was formed the Federated Builders' Association. The Federated Association was merged into the Builders' Exchange in 1892, when the Exchange became incorporated.

The first President was Mr. Wm. J. Hill, who subsequently represented the Liberal interest in West York in the Ontario Legislature.

The Exchange at first occupied offices at Victoria street near Adelaide street; later, more suitable premises were taken on Victoria street near King street. The present premises are entirely inadequate for the largely increased membership, and the Board of Directors are negotiating for premises which will give ample accommodation for all branches of the building trade. The new premises will comprise offices for the various sections, together with Board room, Estimating rooms, Committee room and a large general Assembly room.

The management of the Exchange is vested in a Board of Directors which meets monthly. The following committees deal with such matters as come within their province: Finance Committee, Legislation Committee, Labor Committee.

Should any differences arise between members, the same may be referred to an Arbitration Committee for settlement.

The usefulness of the Exchange has been manifested in many instances. The advisability of adopting a uniform contract form has been for some time very apparent, some of the contracts which builders have been called upon to sign having been notoriously unfair.

By mutual agreement between the Architects' Association and the Exchange, the "Revised Contract" was amended in 1904 and this form will be used in all future contracts.

The adjustment of labor difficulties in connection with the building trade has also been a feature of the Exchange [illegible] a policy of fairness and conciliation in treating with their employees is the best, and the Exchange has endeavored to carry out this principle, although when the demands of organized labor were unreasonable, the Exchange has always declined to accede to such demands.

The usefulness of the Exchange in every-day affairs becomes daily more apparent.

Apart from other considerations, the daily association of men engaged in similar lines of industry must, naturally, result in better feeling, and broader and more liberal views in business matters. In proportion to the interest taken in Exchange work by the members will its usefulness be extended.

The large amounts of money expended every year in building operations, and so large a percentage of the population being employed thereon, the Builders' Exchange must necessarily be an important factor in the future of Toronto.

The Act of Incorporation states that the purpose of the Exchange shall be to "inculcate just and equitable principles, and to promote good feeling and harmony among those engaged in the building trade, to the end that membership in this Society shall be an assurance to the public of skill, honorable reputation and probity."

These principles, if carried out in practice, must prove beneficial to all the trade, and fully justify the existence of the Exchange.

Mr. George Duthié, president, was born in Toronto, where he has resided for the greater part of his life. In 1888, on the retirement of his father, he became head of the firm of G. Duthie & Sons, roofers, etc., and for the last seven years he has been manager of the Roofers' Supply Company. Many important contracts in Ontario, Quebec and the Maritime Provinces have been performed by the firm with which Mr. Duthie is connected. He takes an active interest in the welfare of the Builders' Exchange, and co-operates heartily with any schemes whereby its members may be benefitted.

Mr. Thomas Self, of the contracting firm of Self Brothers, is first vice-president. Mr. Self was born in Ireland. He located in Toronto when he was twenty years of age and has resided there ever since. In 1888 he began business on his own account, and has been engaged in many important building contracts, among which were the Manufacturers' Building at the Exhibition Grounds and Massey Hall. Mr. Self has been a member of the Builders' Exchange for fifteen years.

Mr. C. W. Batt, of Toronto Junction, is second vice-president. He is a native of Hampshire, England, and came to this country in 1871. He spent a number of years in Bothwell, Ontario, where he was engaged in the building and lumbering business. In 1888 he moved to Toronto Junction, where he has since resided and has become well known as a contractor.

Mr. J. L. Phillips, secretary, has been connected with the Exchange for some fourteen years, and has held the office of secretary nearly ever since the organization received the charter of incorporation.

Mr. James Crang, treasurer, in 1878, in partnership with Mr. John Harris, took over the mason contracting business of Mr. Wm. Booth, for whom Mr. Crang had previously been foreman. In 1883 this partnership was dissolved and Mr. Crang has since carried on the business himself. The Home for Incurables, and St. Lawrence Market are some Toronto buildings with the erection of which he was connected.

Mr. John M. Gander, president of the Plasterers' section, came from London, England, to Toronto, in 1870, where he has since resided, except for a few years spent in his native land. Mr. Gander has per[illegible] percentage of the bank buildings in Toronto having been done by him.

Mr. Frederick Holmes, president of the Stone Cutters' section, is a native of Norwich, England. He engaged extensively in contracting in Lancashire, and was at one time vice-president of the Manchester Contractors' Association. In 1882 Mr. Holmes came to Canada and has ever since been connected with the building trade. The Board of Trade Building, Foresters' Temple and Alexandra Palace are some Toronto buildings with whose construction he has been identified.

Mr. Arthur Dinnis, of 126 Walmer road, Toronto, is president of the Carpenters' section.

Mr. Frank Saunders, head of the contracting firm of F. Saunders & Son, is president of the Masons' section. Mr. Saunders is a native of England, his home having been near Cambridge. He came to Canada about thirty-five years ago, and for the last twenty-four years has resided in Toronto, where he has been engaged in the masonry and contracting business.

Mr. William Pears, president of the Brick Manufacturers' section, was born in Toronto. For the past twenty-five years he has been engaged in the brick business at Toronto Junction, Ontario; during the last four he has had control of the Ontario Paving Brick Company. Mr. Pears held the position of president of the Exchange for a period of two years.

MR. T. SELF, 1st Vice President.

MR. C. W. BATT, 2nd Vice-President.

MR. JAS. CRANG, Treasurer.

MR. J. L. PHILLIPS, Secretary.

MR. GEORGE DUTHIE, President.

MR. F. HOLMES, Pres. Stone Cutters' Section.

MR. A. DINNIS, Pres. Carpenters' Section.

MR. F. SAUNDERS, Pres. Masons' Section.

MR. J. M. GANDER, Pres. Plasterers' Section.

OFFICERS AND DIRECTORS OF THE TORONTO BUILDERS' EXCHANGE.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

W. H. F. writes :—Could you give me a good method of coloring cement building blocks?

ANS.—Colors used should be of the best metallic oxides, free from sulphur. Never use Venetian red or lamp black. They run and fade and soften the mortar. For black use excelsior carbon black. This is the strongest black known. For red use best raw iron oxide. For buff use best ochre. For blue use ultra-

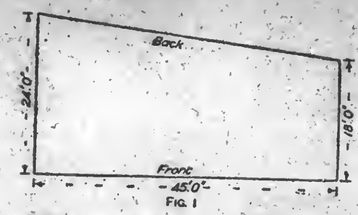


FIG. 1

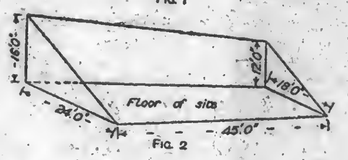


FIG. 2

marine. For white use marble dust or white silica sand, color to suit. In all cases the cement will tend to fade the colors, so always make the shades a little darker than wanted. When once fixed the colors are permanent.

From "Builder": I have a piece of land with a slope of one in 1½, which is to be excavated for a copy cottage having a frontage of 45 feet, depth at one end 18 feet and at the other end 24 feet, how many cubic yards will have to be excavated to get a good level bottom.

ANS.:— The plan we show in Figure 1, the fall of ground being 1 in 1½. Assuming the hill to slope up behind the cottage, and the front of the building placed along a contour line, so that the wedge to be excavated dies off to nothing, the quantity of excavation will be found as follows :—24 ft. at 1½ to 1 = 16 feet depth of excavation; and 18 feet, = 12 ft. depth as shown in Fig. 2. Then the area will be approximately (mean area of ends × length) –

$$\left\{\frac{18 \times 12}{2} + \frac{24 \times 16}{2}\right\} \div 2 \times 45 = \frac{108 + 192}{2} \times 45 =$$

6750 cub. ft.; or it may be found more accurately by the prismoidal formula 1/6 length (end areas 4 times middle area)

$$= \frac{45}{6}\left\{108 + 192 + 4 \times 1/2\,\frac{(16 + 12) \times 1/2\,(24 + 18}{2}\right\} = 7.5\,(108 + 192 + 588) =$$

6,660 cub. ft. = 246 2/3 cub. yards.

From "Young Workman": I have 13 or 14 hundred dollars am newly married and wish to build myself an artistic little cottage containing 6 rooms and closets and pantry. Three rooms downstairs and three above. Rooms need not be very large. Can this be built within the sum named? in the neighborhood of Parry Sound, Ont.

Ans:—Just now the cost of building is pretty high, but we think, by close figuring you may be able to get a fairly nice house for the sum you propose expending. We submit a prespective view and plans of just such a house as we think you will be pleased with.

Little need be said by way of explanation or commen as to to the exterior appearance or the size and arrangement of the rooms. The frame of the building is of pine covered with matched boards. The outside finish is of pine, with pine clap-boards on first storey; the second storey to be covered with 4 in. redwood shingles, stained with Cabet's creosote stain before laying.

It will be observed that all the rooms are a fair size both above and below and that direct access is had to all the chambers from the stairway and hall. The feature of a front hall and stair case as commodious as those shown here is of itself a striking excellence, the value of which will be daily appreciated by the occupants of the house.

A very general impression seems to prevail among these who build either for rent or for their own occupancy the cheaper class of houses that a front hall and stairway are a luxury to which none but the rich can justly aspire. That this is an error we have shown both in the present design. A front hall ought to be regarded, if not in the light of a necessity, at least in that of a very substantial comfort which amply repays the cost of construction. A outer door opening into the room in which the guests are entertained is an awkard arrangement; so is a main stairway leading from the rear of the parlor or sitting room. Both can be avoided with economy.

The wood finish is selected pine, painted three coats. Simple wood mantels of neat design are placed in the parlor and dining room. The pantry is well fitted with shelves and bins. Rear exit is had from

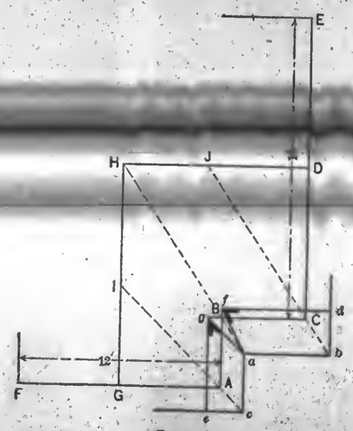


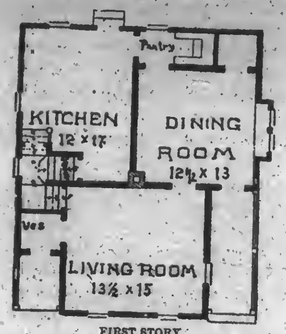
FIG. 3.

the kitchen and from the dining room through an entry 4½ by 5 unto the rear porch the passing from the cellar leads from the kitchen down under the main stairway. The hall stairway is finished with square newel posts and simply turned balusters.

The stairs land in the upper hall from which direct entrance is had to the three chambers which are of good size and provided with closets each of fair size. The plastering is of three coat work, hard finished in white. The first storey of the house is nine feet and the

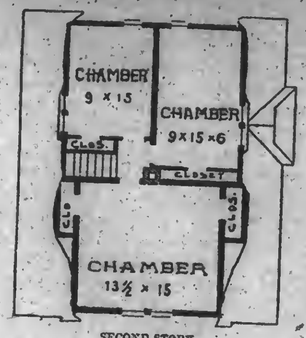
second storey is eight feet in the clear. The foundation of the building is built of good stone laid in lime mortar. The porches have level coilings of pine. All valleys are lined with tin. Hanging tin gutters are provided for all these eaves. If an architect is near you, we would advise you to employ him to make details and such specifications as you may require. It will pay you in the end.

From "Young Carpenter":—How can I obtain the lines for cutting a raking planceer of a cornice when



FIRST STORY.

PERSPECTIVE VIEW.



SECOND STORY.

the roofs are joined and have different degrees of pitch, the plates being level? also, how are the lines obtained for the down bevels of purlins running between hips and setting square with pitch ot roof? Answers with diagrams will be appreciated.

ANS.—With regard to the first query suppose Fig. 3 to be a diagram of a 12 ft. span, one half of which is joined to a span of 18 feet of ½ pitch, the two parts being joined at right angles. F A B C a

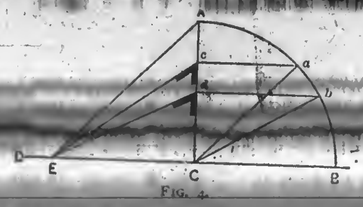


FIG. 4.

plate lines and the inner planceer lines G H and H D are the ridge lines of the two parts. A I is a common rafter of one half pitch: C J is a common rafter of one third pitch: B H is the valley line where the roofs join: c and a b represent the outer edge of the planceer. Extend I A to c set off with the dividers the distance A c to e and draw e g g B. Extend J C to b and with the dividers set off C b to d. Draw d f and f B, connect a f and a g. Set bevels at the angles g and f as shown. These will give the mitre for each side of the planceer. In order to obtain the down cut draw the quarter arc A B, Fig 4. Draw B D indefinitely; then draw from A at an angle of 45° a line intersecting B D, which establishes the point E. Draw C a one-half pitch and C b one-third pitch. Square cut from a and b to the line A C, establishing the points c and d. Connect c E and d E; set bevels at the angles c and d, which will give the down cuts for the planceer and molds and fascia set square with the rafters.

To the second query we may say, that at Fig. 5. we show a method of finding cuts for purlins in rectangular roofs of equal pitch. In order to comply with "Young Carpenters" request, the side A B of the purlin is placed square with the pitch of the roof but this method may be applied to purlins with their sides placed at any required angle. The object is to be able to cut the ends of the purlin so that they will fit a vertical plane regardless of the pitch of the roof or whether the purlin is to fit against the hip or valley, or against the beveled end of another purlin.

Referring to the drawing the lines A B and B M must be drawn square with each other, and the purlins must be square cornered. Draw the line A B at the required pitch of the face side of the purlin and draw B M square from A B. Now through B drow a vertical line as B D, and draw A D square with B D.

To lay off the bevels proceed as follows :— Draw A F square from A B. Take A D as a radius and draw the arc D F. Now draw B F. The angle at F gives the bevel for the face side of A B. The next step is to take B D for a radius and draw the arc D M. Draw [illegible] on the side B M.

To find the figures on the steel square to lay off the bevels proceed as follows: The four line A B, B M, B D and A D, are all that will be required. Take A B

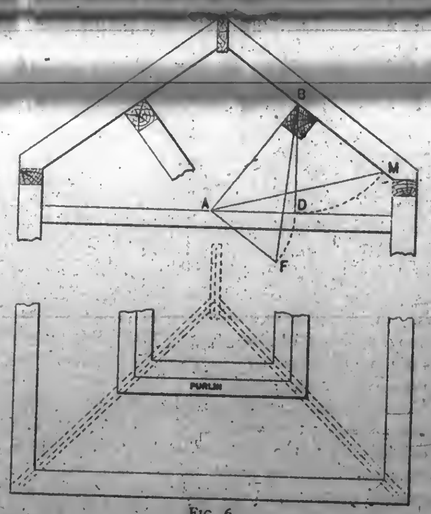


FIG. 6.

on the blade and A D on the tongue and use the bevel of the tongue for the face side A B. Now take A B on the blade B D on the tongue and use the bevel of the tongue for the miter of the side B M.

MONTREAL NOTES.

The beginning of May as usual set in motion a considerable volume of building operations, the first step in which is in many cases the demolition of old properties. This fate has overtaken an interesting group of little old stone buildings at the corner of Craig street and St. Urban streets, where the Montreal Light, Heat & Power Company are about to build. The appearance of Victoria Square is to be altered by the erection of two ten storey blocks. At the corner of Craig street and the square, Mark Fisher Sons & Company are to have a new fire proof building, with frontage of 83 feet and 77 feet, faced with Grey Canyon stone upon a granite base. In design the building follows the type of the Bank of Ottawa and the Sovereign Bank, in St. James street, and many other tall buildings. That is to say it consists of a series of five plain stories, set upon a pedestal which includes the three lowest floors and surmounted by two more ornate stories, the windows of the lower of which occupy a frieze below the main cornice, whilst those of the upper form an architectural 'attic' above the cornice. In streets of ordinary widths this type has the defect that the component parts of its design can never be seen together. It is more suited, as in this case, to a square where there are points of view from which the eye can take in the whole design at once. A more series defect in the design of tall buildings generally however is that they are almost always built with only one or two faces even endeavoring to shew any beauty of form. They stand up like towers among the older buildings —towers of a lob-sided and maimed description—and cropping up spasmodically as they do, each flaunting this same painful vice, the total effect, as exemplified in New York City, is jerky and untidy. Is it perhaps too much to expect ot modern human nature to make the back of a thing decent even when it is as much evidence as the front.

The other tall building about to be erected in Victoria Square is the Eastern Townships Bank at the corner ot St. James street. This also is to be of ten stories. It is proposed to spent about $500,000 upon it.

The plans of the new [illegible] for the Natural History Society's Museum, have been prepared by Messrs. Taylor, Hogle & Davis. Besides the museum rooms there is provided a lecture hall to accommodate seven hundred people, a smaller lecture hall, and committee rooms and offices. A praiseworthy decision of the society is to employ in the construction only material of local origin. It is a refreshing piece of good sense in these days when there is a sort of craze to ransack the earth in seach of something no better than what is to be had at home,—to resolve to make the best of the good things that are at our own doors. When Solomon or whoever is responsible for the proverb spoke of the eyes of a fool being in the ends of the earth he surely wished to inculate some such homely wisdom as this.

It is understood that the question of the mountain outlook is now on the eve of being definitely settled; if so, credit is due to the action of the P. Q. A. A., whose committee on civic improvements has been using its influence in the matter. It is true that the scheme has not yet passed the stage so often fatal to schemes of the kind, that is to say, the calling of bids for contract. The work has, however, been arranged with extreme simplicity, being simply a semi-circular terrace walk supported on a rubble retaining wall reinforced at intervals by rusticated piers, whose long and short courses bond into the rubble wall. The parapet is a balustrade, apparently of stone, with dies over the wall piers. There is no roof; but a small covered shelter is provided not far from the northern end of the promenade. The roof has been dispensed with in order that 'carriage people' may not have their view impeded by what could only benefit the inconsiderable pedestrian. Accepting the expediency of this dispensation, it is to be earnestly hoped that existing trees will not be too vigorously cleared away. Their shade would be grateful and they would successfully temper the too rigid formality of a purely architectural arrangement. Messrs. Marchand & Maxwell have collaborated on the design for this outlook.

There seems some prospect of an abatement to the overhead wire nuisance. The Bell Telephone Co. is applying for a large increase of capital, and Mayor Ekers has suggested that the compulsory placing of all wires under ground would be an appropriate accompaniment of an extended scope in their operations. Further, the City has taken action against the Montreal Light, Heat & Power Company for unlawfully placing poles and wire on Cote street. Preliminary objections raised by the company have been overruled, and the Recorder has directed that the city's action be inscribed for proof. In some cases, as for example in Notre Dame street between McGill street and Bonaventure station, the air is fairly darkened by wires. No matter how excellent the architecture may be, streets can hardly look respectable with masses of cobwebs overhead and poles of many sizes and at many angles lining the way.

On the 29th of April there occurred a collapse of a floor in the Library Building [illegible] being one of a particularly insidious nature. The building is a pretty old one, and several rooms of perhaps 25 feet by 50 feet directly over one another had floors carried on single flooring joists across the shorter dimension. Mr. Granger having the intention to place heavy loads of books on these floors prudently took the precaution to have the floors strengthened by trussings. Yet when the increased load was placed on the topmost floor it collapsed, not apparently by the failure of either joists or trussing but by the failure of the wall on which they rested. The circumstance was then revealed that this, the division wall between two properties, had been built in two

STORE IN PHILLIPS' SQUARE.

sections, one of which consisted of only 4 inch brick; and on this four inch skin alone the floor joists rested. Having no bond or attachment to the other section it had buckled and peeled off. The floor strongly held together by the recent trussing sank 'en masse' and carried the lower floor with it. In making alterations —even if they be all improvements—upon an old building, one cannot be too careful; inherent faults of the above description do not reveal themselves to the most careful scrutiny.

The illustration in the text represents Messrs. Jenkins' antique furniture store recently erected in Phillips Square; Messrs. Ed. & W. S. Maxwell, architects. The dressings are yellow sandstone, the brickwork of a dull red sand and lime brick, the cornice is of sheet metal. The lintel over the shop window is faced with wrought iron plate.

THE P. Q. A. A. SKETCHING CLUB.

THE ALEXANBRA HOSPITAL.

On Saturday, 5th May, the members visited the Alexandra Hospital for contagious diseases at Point St. Charles. Mr. W. S. Maxwell kindly conducted the party through the buildings, which were at the time just on the point of completion. The buildings generaly are of plastic brick with a few Roman stone dressings. The floors are concrete on steel and all corridors of communication are similarly concrete in floors, walls and roofs. Three blocks, for different diseases, radiate from the central administrative building in which is placed a main kitchen surrounded by a corridor where attendants have the meals passed out to them for distribution to the various departments. In this way the attendants do not enter the kitchen or come in contact with one another. The wards are reached by cross ventilated inclined passages up and down. The floors of the wards are of cement concrete in slabs. The doors are flush, veneered with varnished gum wood. At the end of each ward is a large glass enclosed verandah. The windows generally are balance weight sashes with hinged fanlight at top. The laundry is in a separate building. Another contains stable, coach house, mortuary and mortuary chapel. The sewage is disinfected with chemicals before being run into the city sewers. The nurse accommodation is on the third floor at that end of the ward buildings which is nearest to the administrative building. The nurses for each disease do not come in contact with those attending on patients suffering from another sickness.

PRIZES FOR WINTER WORK.

The final announcements in the monthly competitions during the winter 1605-6 were made on the evening of Wednesday, 9th May. Of five monthly competitions held, Mr. H. E. Fortin was placed first in three and Mr. A. J. King first in two. Mr. Fortin therefore receives three monthly prizes of the value of $6 each, besides the prize of the value of $25 for the best aggregate. Mr. King receives two monthly prizes of the value of $6 each.

The Standard Ideal
Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron
Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QUALITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTTION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

A NEW ARCHITECTS' ASSOCIATION.

A call is shortly to be made for the formation of an Association of Architects and Structural Engineers in western Canada. It has long been felt necessary that such an association should be formed, and we understand that a large number of names have already been handed in of those desirous of becoming chartered members.

The proposed name of the Association is the Western Canada Architectural Association. It will be composed of honorary members, active members and probationary members. The latter class has been made purposely to allow the draughtsmen to be enrolled as members of the Architectural Association, and should be a great help to them.

Owing to the present busy building season, and at the request of a number of the outside architects, the matter of organizing has been deferred until July, although the preliminary work is now well advanced, and the advent of the Association is absolutely certain.

The Association will likely procure a Dominion Charter and all architects, structural engineers, and draughtsmen from Port Arthur to the Pacific Coast will be eligible to membership. Those wishing to be placed on the charter list should send in their names to the secretary pro-tem: Western Canada Architectural Association, P. O. Box 347, Winnipeg Man., or to P. O. Box 189, Regina, Sask.

The Association will not interfere with or be in opposition to any local or provincial organization, but will itself endeavor to form the membership into provincial and town branches.

Building Construction or Structural Engineering as it is usually styled has been developing so rapidly in recent years that "specialists" are devoting their entire time to this work. Two decades ago the railway bridge engineer was called in to design the structural features of steel and masonry buildings. To-day the engineer whether called as consultant or designer must be more than a bridge expert. He must bring to his work a sympathy with the architect's problem and he must also be able to enter into the spirit of the work before he can properly solve the structural problem involved therein. In other words he must have had sufficient experience in the practice of architecture to know the language of architects without the use of a key. Architects will be interested to learn that Mr. William Fry Scott, structural engineer, author of Structural Designers Hand-Book, graduate of the School of Practical Science, Toronto, member of the American Society for Testing Materials, member of the International Association for Testing Materials, after having gained experience of methods of construction adopted in the leading cities of the United States, has opened an office as a consulting engineer in Toronto. His card appears in another column.

TRADE BRANTFORD ROOFING CO. LIMITED MARK
"B"
BRANTFORD, ONT.

WROUGHT IRON FENCE

Make a Neat Appearance, Form a Perfect Protection and will last a Life Time

Designs from $1.00 a foot upwards. Send for Bulletin No. 23

CANADA FOUNDRY CO., Limited
Head Office and Works: TORONTO, ONT.
District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

BLUEPRINT SPECIFICATIONS.

When a number of copies of a specification or other paper are wanted, and none of the ordinary methods is convenient or desirable, make blueprints from the typewritten sheet, suggests a correspondent of the American Machinist.

Write the matter out on the typewriter, putting a piece of carbon paper in back of the sheet to give the printing density on both sides of the paper, then proceed with the blueprints in the usual manner. Use manifolding paper, the grade called unglazed onion skin. For white prints use new carbon paper and make the prints from that, in which case the letters will appear on a white ground. The carbon paper is more expensive than the white paper.

The Canadian Architect & Builder received a pleasant call recently from Mr. McDonald, publisher of the Western Builder, Milwaukee. Mr. Walker is a Canadian, and has been spending a few days with friends at his old home at Tilsonburg, Ont.

Contractors who are interested in a short method of making up estimates are referred to the book advertised by the Bradt Publishing Company on page x. of this number. A post card to the company, referring to this advertisement, will bring full particulars.

The strike of painters in St. John has been successful. They have obtained an increase of 25 cents a day. There is talk, among masons, carpenters and other building trades workmen of demanding shorter hours. A nine hour day is the general rule in St. John.

WILLIAM FRY SCOTT
STRUCTURAL ENGINEER
Consultation or Design: Buildings, Building Construction, Foundations, Walls, Roofs, Bridges, Masonry, Fireproofing, Reinforced Concrete, Reinforced Brick, Steel, Timber, Specifications, Examinations, Valuations, and Reports for Investment.
22 Toronto St., TORONTO, ONT.
Main 1374 North 4306

MAKES PERFECT CONCRETE

DUNDAS STONE was placed on the market last year, and gave splendid satisfaction. Our perfect crushing, loading, and shipping facilities enable us to ship any quantity, of any size, promptly. Get our prices.

Doolittle & Wilcox, Limited · Hamilton, Ont.

ARCHITECTS!

SPECIFY LUXFER WINDOW PRISMS
SPECIFY LUXFER SIDEWALK PRISMS
SPECIFY LUXFER FIREPROOF GLASS

Do not fear a little expense for good material.

It will pay you in the long run.

Your work is more satisfactory to your client and he is better pleased with what he has got.

Write us for prices or other information.

SPECIFY MARBLE MOSAIC FLOORS
SPECIFY GLASS MOSAIC WALLS
SPECIFY ART GLASS

Luxfer Prism Company, Limited
100 King Street West, TORONTO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
Room B, 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITORIAL ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	W. A. LANGTON,	,,
2ND VICE-PRESIDENT	JOHN E. BELCHER,	Peterborough
TREASURER	H. B. GORDON,	,,
REGISTRAR	W. R. GREGG, 25 King St.,	Toronto

COUNCIL.

WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. E. VANIER, "
TREASURER	J. R. GARDINER, "

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS. W. SELF, 1st Vice-President.
C. W. BATT, 2nd Vice-President.
JAS. CRANG, Treasurer.
H. MARTIN.
THOS. CHRISTIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.
J. JONES.
CHAS. GOULD.
T. WRIGHT.
H. STRATFOLD.
A. NOBES.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.
E. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADERT
C. P. SHINDLER
K. M FRASE
E. G. BAYNE
D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

A. T. DAVIDSON, President.
J. W. MORLEY, 1st Vice-President.
T. R. DEACON, 2nd Vice-President.
A. B. PORTER, Secretary.
T. D. ROBINSON, Treasurer.
DIRECTORS: Thos Black, Jos. Bourgenuit, H. Cass, D. Cameron, V. L. Bouch, Wm. Aisip, Ald. J. G. Latimer, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. P. Aisip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.
JOS. O. DESLAURIERS, Vice-President.
J. HERBERT LAUER, Secretary.
N. T. GAGNON, Past President.
W. R. RAMSAY.
W. B. SHAW.
J. LEFEBVRE.
JOHN DUTHIE.
JOHN L. HARRINGTON
JOHN GRAY.
ALEX. BREMNER.
J. N. ARCAND.
JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Boi ders' Exchange.)
8, St. James Street, Montral.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPANTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAUVAGEAU.
L. Z. MATNIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new Pullman with all latest innovations for travel comfort, leaves Chicago 10.05 P. M. daily, arrives Los Angeles 4.45 P. M. third day via Chicago, Union Pacific & North-Western Line and the Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to the general agent or address, B. H. Bennett, 2 East King Stre Toronto, Ont.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

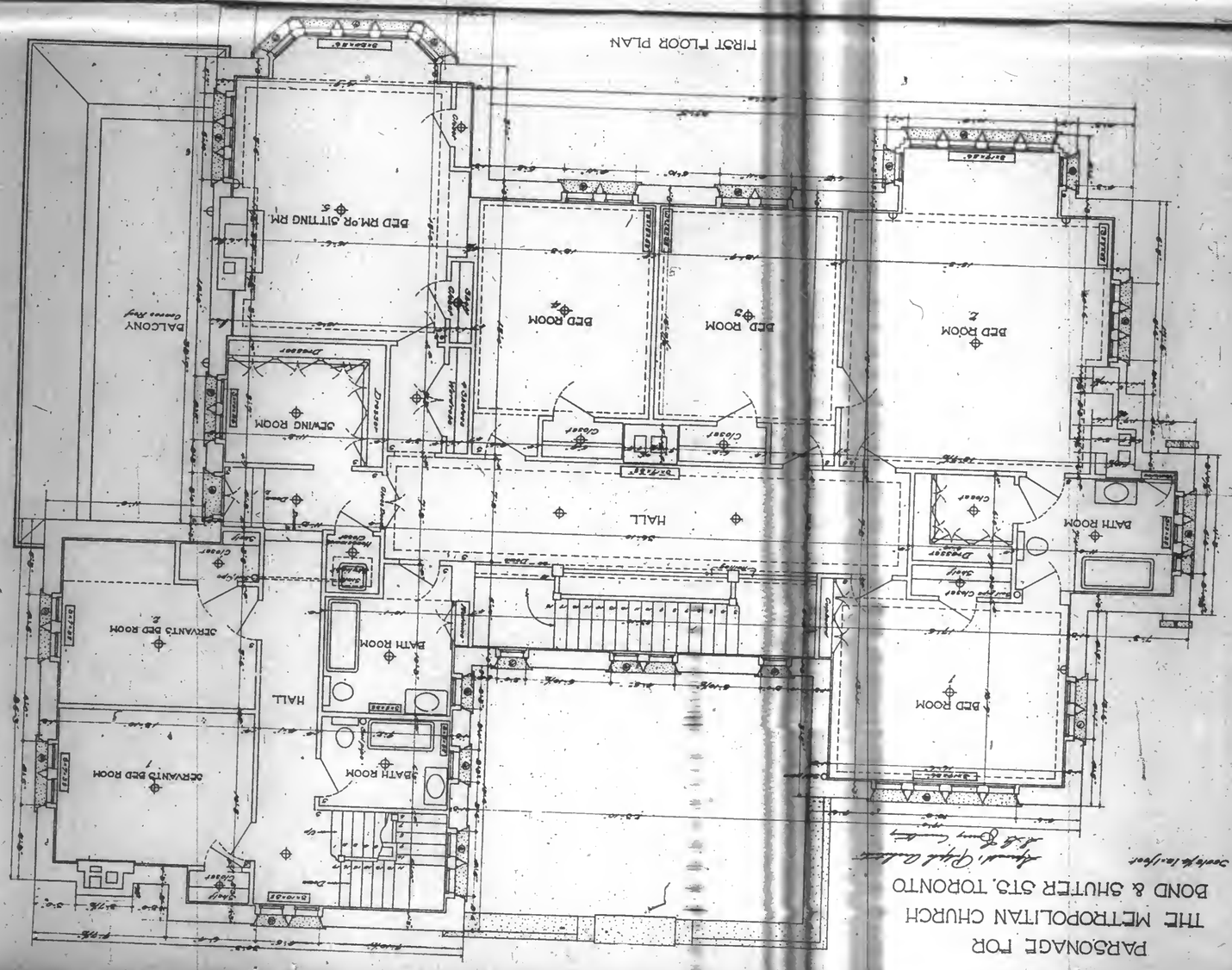
in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

CANADIAN ARCHITECT AND BUILDER.



PARSONAGE FOR THE METROPOLITAN CHURCH
BOND & SHUTER STS. TORONTO

Messrs. Sproatt & Rolph, Architects.

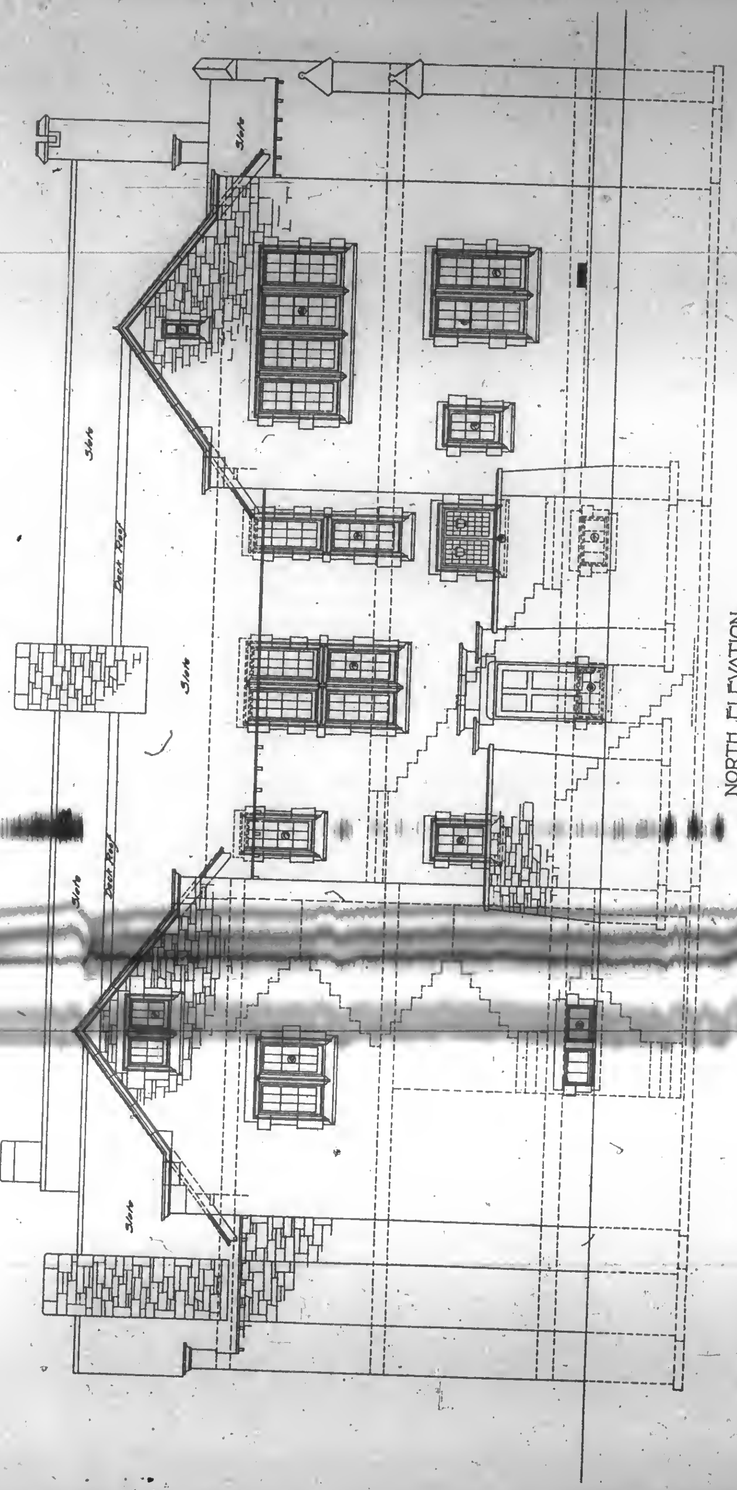
Mr. S. G. Curtis, Builder.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1900.

PARSONAGE FOR
THE METROPOLITAN CHURCH
BOND & SHUTER STS. TORONTO.

Scale 1/8 in. = 1 foot

Sprott, Pigott & Lee
Architects.



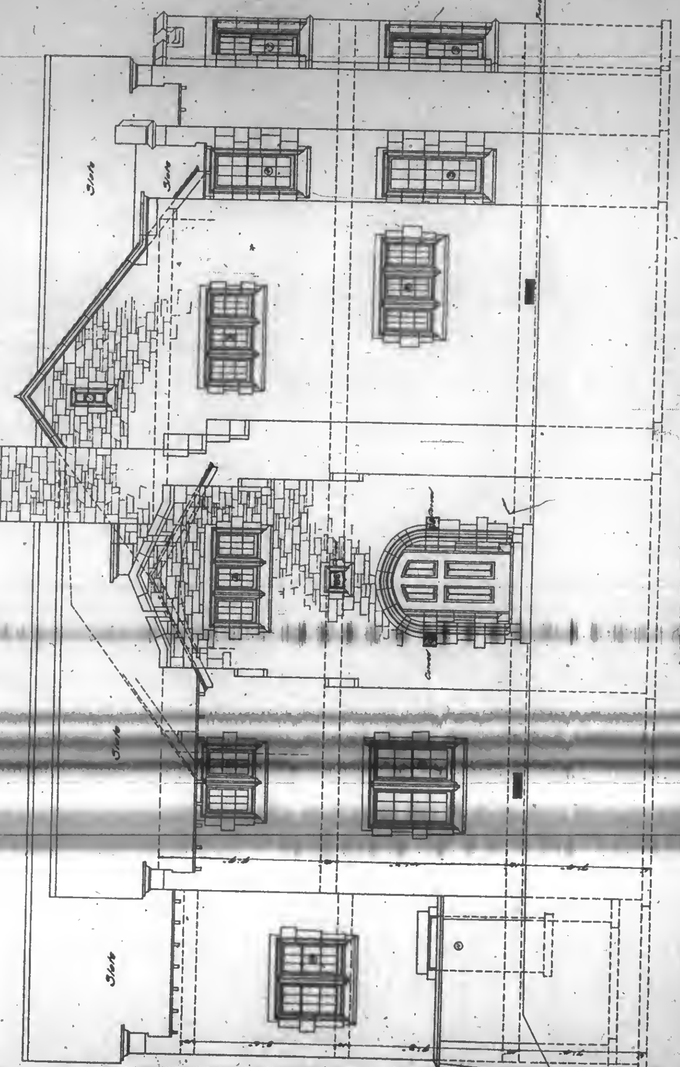
NORTH ELEVATION

CANADIAN ARCHITECT AND BUILDER.

PARSONAGE FOR
THE METROPOLITAN CHURCH
BOND & SHUTER STS. TORONTO.
TO BE ERECTED IN MEMORY OF
ANNA VINCENT MASSEY

Scale 1/8 in. = 1 foot

Sprott, Pigott & Lee
Architects.

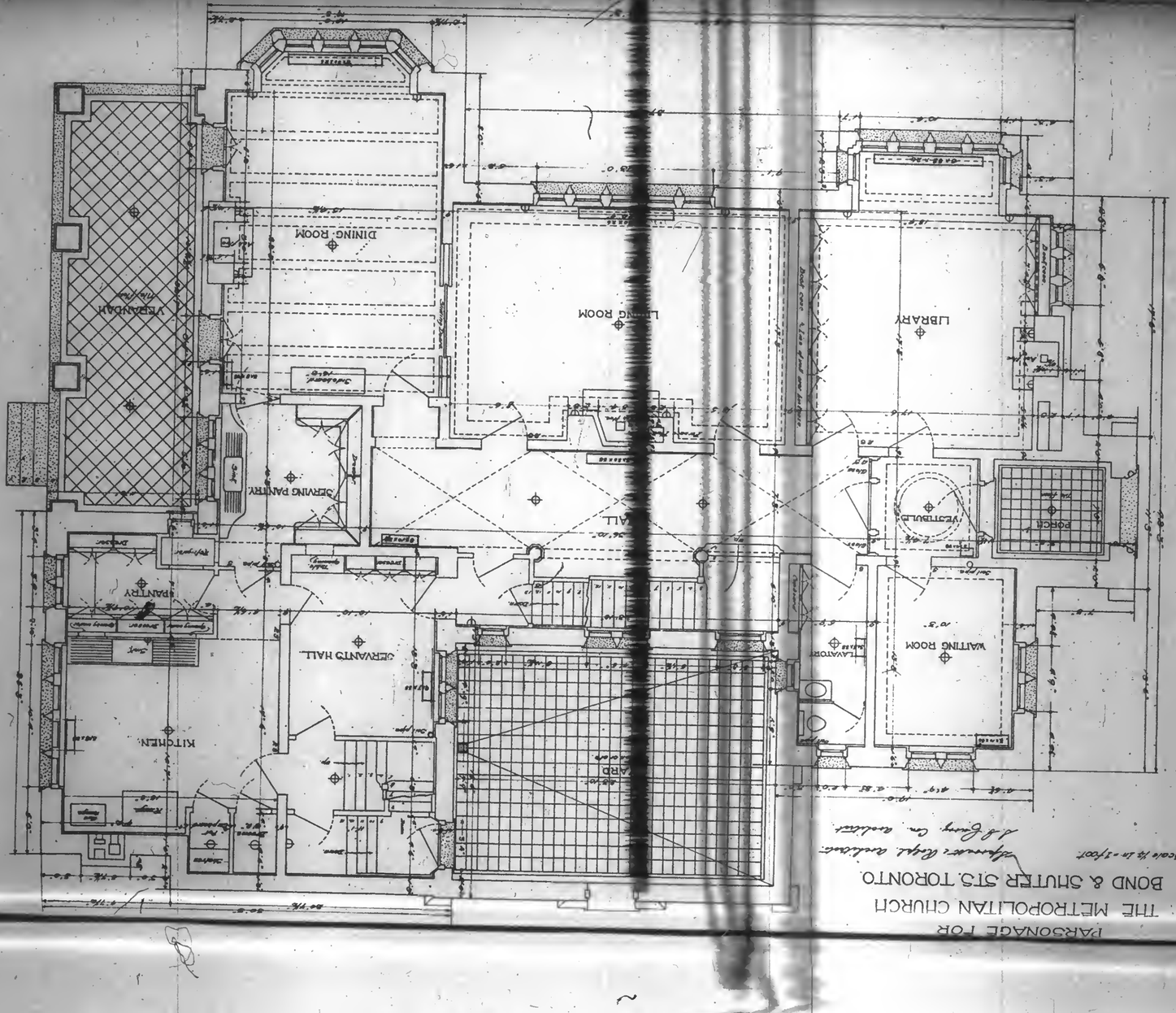


WEST ELEVATION

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1906.

PARSONAGE FOR THE METROPOLITAN CHURCH, TORONTO.

MESSRS. SPROATT & PIGOTT, ARCHITECTS.
MR. S. G. CURRY, CONSULTING ARCHITECT.



PARSONAGE FOR
THE METROPOLITAN CHURCH
BOND & SHUTER STS. TORONTO.

Scale ½ in. = 1 foot

Alfred H. Gray, Chief Architect.
J. B. Gray, Con. Architect.

METROPOLITAN CHURCH, TORONTO.

GRAY & ADOLPH, ARCHITECTS.
CONSULTING ARCHITECT.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 222. JUNE, 1906.

ILLUSTRATIONS ON SHEETS.

Government House, Victoria, B. C.—Mr. F. M. Rattenbury, Architect, Toronto.
Public Reference Library for Toronto.—Messrs. Wickson & Gregg and A. H. Chapman, Associated Architects, Toronto.
House of Small Cost in a Country Town; CANADIAN ARCHITECT AND BUILDER Competition, Illustration IV; designed by Mr. S. Douglas Ritchie, Montreal.

CONTENTS

Editorial Notes	81	Building in Hamilton	93-94
A Talk on Cement	82	Standard Sanitary Manufacturing Company to Erect Plant in the East	95
The P.Q.A.A. Sketching Club Visit to Sault-au-Recollect	83	Contractors' Association	ix
Correspondence	84	New Construction Company	ix
Our Illustrations	85-86	Concerning Dry Rot	x-xi
Illumination	87	Sandstone Deposits	xiv
Montreal Notes	88	Personal	xv
Novel Sash Balance	89	Calgary Labor Troubles	xv
Intercommunication	90-91		
Shingle Stains	92		

The Specialization of Architects.

... amid all the specialization of present conditions of work the architect alone declines, as a rule, to specialize; and he argues that it is for this reason that the architect is ceasing to be an artist and has become a man of business. There is something to be said on this side. That is to say, it is the opportunity to make his work perfect that develops the artist, and it is only by exclusive devotion to one problem or one class of problems that an architect can give his mind to his problem enough to produce real design. Otherwise the stock materials of design, that have served so many purposes, must be tossed up again to put a decent face upon new problems which there is no time to think out. The new problems must, however, be taken up. There are no quiet eddies now in the stream of business. Could something be done by specialization in firms? It will mean larger firms and less profits, but more of a life—and we have only one life.

Smoke Abatement

We are going to be put to shame soon in this matter by cities in the United States. The journals have long been crying out about the non-exaction of the laws against over production of smoke and reforms are now following. That the reforms not only can be brought about but brought about suddenly, is shown by the action of the Mayor of Rochester who decreed that black smoke must cease on the first of June. It ceased on that day; and Rochester since then has been a bright city. An hour or so of black smoke is allowed early in the morning to get things started; but after that, if the watchers stationed on various high towers see any black smoke, there is trouble for the man who made it. That is the way it is done. There is nothing new or remarkable about it except that it is really done. Other towns have about the same laws and the same facilities for carrying them out. One demonstration of the feasibility of carrying out the law will no doubt produce a sequence of similar results.

Western Architects Organizing.

The Manitoba Association of Architects was organized on May 25th, about forty architects being present at Manitoba Hall, where the session was held. Only three or four outside architects were present, but the association will supply a long-felt want to correct the abuses and competition craze which has infested Winnipeg.

The following officers were elected: President, S. F. Peters; Vice-president, J. H. G. Russell; 2nd vice-president, C. H. Wheeler; Treasurer, L. O. Bristow; Secretary, Pery Over. Directors: Messrs. S. Hooper, J. Greenfield, J. Chisholm, Atchison and Elliott.

The constitution adopted was similar to that of the Eastern Associations as was also the schedule of fees. A set of rules governing competitions—to govern which is one of the first reasons for associating—was also adopted. The first rule, that $25,000 should be

the minimum cost of work subject to competition in the ordinary way, shows how necessary it had become h at some agreement should be come to in this matter.

Among those present were Messrs. Rugh, Fineland, Chivers, Northwood, S. Hooper, J. Hooper, A. Melville, W. Melville, Paul Clemens, E S. Estlin, C. H. Wheeler, J. Chisholm, J. Greenfield, W. W. Blair, Eade Bros., Pratt, Howard, Jewitt, Horwood, Tuttle, Gould, R. E. Davies and a number of others.

With the organization of the Western Canada Architectural Association, which will be started in July, the western field will be covered fully. Both these new associations will fill two fields that needed such organizations.

Lessons from San Francisco.

Most of the talk about San Francisco is not edifying. One is reminded of the saying that "wheresoever the carcase is there will the vultures be gathered together." Nearly every 'expert' who rushes into print seems to do so in a spirit of conscientious hustling; to assert that the evidence is in favor of his material as the earthquake-resisting, fire-proof, covering for steel construction.

The situation is rather like that after the battle of Salamis, when the Greek generals decided by vote which of them was the bravest. Each general had two votes to cast. The result of the ballot, (every one receiving one vote while Themistoles got as many as the total number of generals,) showed that every one had voted for Themistocles as well as himself. It was considered therefore at Themistocles had been the bravest. Similarly we may consider it agreed that the number of testimonies in favour of the steel frame and ME tells at any rate in favour of the steel frame. But for a disinterested opinion which may be dealt with real profit we must wait for an official report, such as was made after the Baltimore fire by Captain Sewell of the Corps of Military Engineers at Washington.

In the mean time just to show how different the point of view may be which will be taken by a disinterested observer, whose motive is purely scientific discovery—a Japanese investigation is reported, concluding that there would have been much less damage from the earthquake if there had been good mortar. As people who have overcome difficulties of their own with earthquakes the Japanese are entitled to respect, even if we had no other experience of their scientific exactness.

This opinion has the merit that it opposes no interest. No material is disqualified by the suggestion that it would stand shocks better if laid up in cement mortar —which appears to be the improvement in mortar that is suggested.

The aggregate elasticity of cement extending throughout the height and breadth of a structure is sufficient to take up the movement of a severe earthquake. But the cure must be not only in the use of cement but in its continuous extension. Cement mortar in the beds with vertical joints half empty can be no great improvement; but if all the joints are full, and the cement is continuous throughout the wall; the brick or other material embedded in it being merely a larger form of aggregate; it seems likely, even to ordinary perception, that a considerable movement can pass along the wall without dislocating its parts.

A TALK ON CEMENT.

FIRST PART.

In the Report of the Bureau of Mines for Ontario, Vol. XIV., Part 1, there is an admirable account by P. Gillespie of the Cement Industry of Ontario, which will be the basis of this article.

Mr. Gillespie goes at considerable length into the nature, sources of origin and process of manufacture of cement, and describes the plant, the process and the product of each of the nineteen factories in Ontario, of which fifteen are producers of Portland cement and four of natural cement.

The chemical composition of cement is somewhat complicated. It includes lime, magnesia, silica, alumina, oxide of iron, and sulphuric acid; and the exact nature of the processes involved in its hardening is (if we may judge from the fact that the Prussian Government and the German Society of Portland Cement Manufacturers have offered prizes for essays on the subject) not perfectly understood; but the essential ingredients of Portland cement are lime and clay. The marl, which in all but one of the Ontario Portland Cement Companies is the source of the lime, contains all the minor ingredients.

Portland cement, as is generally known, means nothing more than artificial cement. The name was given to it by the first maker, Joseph Aspdin, from its fancied resemblance when hardened to the limestone quarried on the island of Portland on the south coast of England and known as Portland stone.

Natural cement is produced by burning an impure limestone which contains lime, magnesia and clay. These ingredients vary in different parts of the quarry. Some parts are over-limed, some are over-clayed, so that when rock is brought together from different parts of the quarry, though the total result is sufficiently well proportioned, the difficulty in accomplishing a constant and intimate mixture of the ingredients when burned makes the natural cement less likely to develop the strength for which good Portland cement has acquired a reputation.

The difference in strength may be gathered from Mr. Gillespie's statement that a mortar which will develop, in three months, an ultimate tensile strength of 200 pounds to the square inch may be made with 1 of Portland cement to 5 of sand, while a natural cement mortar for the same specification would require to be mixed in about the ratio of 1 of cement to 2 of sand.

This, however, limits rather than bars the use of natural cement. If no great strength is required, natural cement has the advantage of Portland in respect of cheapness. The prices are about $0.90 a barrel for natural cement, and $2 50 for Portland. With these prices, and sand at $1.25 a cubic yard, it will be found that of two foundation walls, built, the one with Portland cement mortar and the other with natural cement mortar, according to the above specifications, that built with natural cement mortar would be the cheaper. A cubic yard of Portland cement mortar would cost $4.12, while a cubic yard of natural cement mortar would only cost $3.25.

Natural cement also sets more quickly than Portland cement. The former usually begins to set in five to forty minutes, and attains its permanent set in twenty minutes to two and a half hours. Portland on the other hand begins to set in three fourths of an hour to three hours, and attains its final set in two and a half to eight hours.

Therefore, if no great strength is required and a rapid setting mortar is desirable, Natural cement may be employed with advantage in the way of economy.

The Portland Cement plants of Ontario, mentioned in this Report are :—

The Bellville Portland Cement Co., Works, at Point Ann, Ont.; in prospect when the Report was written.

The Canadian Portland Cement Co., (an amalgamation of the Rathbun Company and the Beaver Cement Company). Works at Marlbank and Strathcona. Brand "Star."

The Colonial Portland Cement Co., Works at Wiarton, Ont.; in process construction when the Report was written.

The Grey and Bruce Portland Co., Works at Brookholm, Ont. Brand "Hercules."

Hanover Portland Cement Co., Works at Hanover, Ont. Brand "Saugeen."

The Imperial Portland Cement Co., Works at Owen Sound, Brand "Imperial."

The International Portland Cement Co., Works at Hull, Que.; in process of construction when the Report was written.

The Lakefield Portland Cement Co., Works at Lakefield, Ont. Brand "Monarch."

The National Portland Cement Co., Works, Durham, Ont. Brand "National."

The Ontario Portland Cement Co., Works at Blue Lake, Ont. Brand 'Giant."

The Owen Sound Portland Cement Co., Works at Shallow Lake, Ont. Brand "Samson."

The Raven Lake Portland Cement Co., Works, Raven Lake, Ont. Brand "Raven."

The Sun Portland Cement Co., Works, Owen Sound, Ont. Brand "Sun."

The Superior Portland Cement Co., Works, Orangeville, Ont. Brand "Superior."

The Western Ontario Portland Cement Co., Works at Atwood, Ont.; in prospect when the Report was written.

The Natural Cement plants of Ontario, mentioned in the Report are :—

The Queenston Cement Works, near Queenston, Ont. producing "Queenston" cement.

The Estate of John Battle in Thorold, producing "Thorold" cement.

V. Schwendman, Township of Barton, four miles from Hamilton.

Toronto Lime Company, Limehouse, Ont. Brand "Ontario."

Coming to the uses of cement we may note in passing a special use mentioned in the Report, which is worth noting. As cement preserves steel, cement is sometimes used as a pigment to preserve from corrosion steel structures that are exposed to the gases of passing locomotives. A paste composed of red lead, cement and japan, is applied in a thickness of one quarter of an inch.

In general however our concern with cement is for construction purposes, either for mortar or concrete.

The use of cement for mortar is one point in which we have advanced beyond former generations in building. The lime mortar which for twenty centuries or more has been used with bricks is an unequal match for them in strength. The compressive strength of lime mortar is about 500 lb. to the square inch. Brick will resist a pressure ten times as great—about 5,000 lb. to the square inch. Portland cement mortar, which develops a compressive strength of about 4,000 lb. to the square inch, comes near to making, with common hard brick, a wall of strength equal throughout.

Neat cement is stronger than any mortar. The addition of sand weakens in proportion to the quantity added. The following table is given as representing the relative strengths in the average case.

Mixture.		Relative Strength.
Cement.	Sand.	
1	0	1
1	1	⅔
1	2	½
1	3	⅓
1	4	¼

Lime paste is often added to cement mortar for the sake of cheapness, strength, imperviousness, and a desire to obtain a smoothness in working which is not possible with cement alone. Investigation seems to prove that an addition of lime paste not exceeding twenty per cent. of the mortar will not reduce the strength, and in some cases appears to increase it; and it gives the mortar a "body" much desired by the workmen. Beyond the limit given it is not wise to go if strength is the point desired.

The Owen Sound Portland Cement Company, in their brochure on the uses of cement suggest the following: "If it is desired to make water-tight mortar for cisterns and reservoirs, and where absolutely water-tight work is required, the following proportions are recommended.

Portland cement.	Sand.	Lime paste.
1 part	2 parts	½ part
1 part	3 parts	1 part"

Impervious mortar has been the subject of experiment in the State University, Columbus, Ohio. The following is a summary of the finding:

"The permeability cannot be materially reduced by the application of soap and alum solutions or by finely powdered loam used in the sand, but it can be reduced (1) by the application of one to five coats of cement grout, the reduction amounting to from seventy to ninety eight per cent. of the initial leakage; (2) by a coating of neat cement mortar one quarter of an inch thick; (3) by the mortar surface standing under a head of water containing suspended matter."

The following table is quoted, taken from a circular issued by the Buckeye Portland Cement Co., Harper, Ohio. It gives the amount of cement, sand and lime paste needed to lay one thousand bricks.

Mortar in all cases 6 : 1 : 1.

Joint.	Proportion of mortar to brick.	Bus. of sand.	Bbls. of cement.	Bus. of lime.
⅛ in.	1 to 9	3.8	.21	.64
¼ in.	1 to 4	9.6	.53	1.6
⅜ in.	3 to 10	12.5	.70	2.1
½ in.	1 to 3	15.2	.83	2.5

The second use of cement, viz. for concrete, and the question of tests and specification, it will be necessary to reserve for our next number.

THE P.Q.A.A. SKETCHING CLUB VISIT TO SAULT-AU-RECOLLET.

On Saturday, 19th May, the members of the Sketching Club visited Sault-au-Recollet where the old church is of considerable interest. The building itself belongs to the 18th century but the facade has been re-built and re-modelled about 1850. Both the older and the newer work are highly picturesque. There are some charming old cottages in the neighbourhood.

MCGILL STUDENTS UNION AND MOUNT ROYAL CLUB.

Members of the Sketching Club visited the Students Union and the new building of the Mount Royal Club on Saturday 9th June. This visit provided an exceedingly interesting object lesson in two different ideals in architecture. The Union by Professor Nobbs is typical of the English school of Architecture which finds an inspiration in the varied characters of its materials and in the methods of their application and processes of manipulation. By observing and giving values to these qualities the works and process of nature become the craftsman's standard. In the matter of proportion —purpose efficiently fulfilled is the fountain-head whose influence permeates all and whose stream must never be entirely drained by its surroundings which should only be those natural growths which it feeds. In decoration sentiment pertaining individually to the work is the *motif;* not introduced with rigid formality, empanelled and isolated, but cropping up on all occasions where the disposition to decorate is felt.

The Mount Royal Club is in its general lines at least, the design of Messrs. McKim, Mead and White, and, while not for a moment to be placed in comparison with their work at the Bank of Montreal, is characteristic of United States (and French) ideals. Severely classic throughout, the conventional forms of architecture—orders, columns, antae etc., reign supreme over all. Refinement of proportion, with an eye all the time on the masterpieces of the 'styles' as a standard, is the source relied on for beauty. An excellence, abstract and absolute is the ultimate aim. The desire as regards technique is for polish. The machine with its precision and regularity carries out the idea of the master, eliminating the tendency to err inherent in the craftsman's hand. Material is secondary, and a cornice in plaster, taking as it does the same form as one of wood, may legitimately be painted to appear as if it were actually part of the wood trim, for forms are used for their own sake as being equally beautiful in all materials. Ornament is conventional in character; and sentiment, if introduced at all, is of the guarded and formal sort which is elaborated in pediments and centerpieces over chimney-pieces. Law and Order are the watchwords of this school, as Liberty and Life are of the other.

The following prizes have been announced as open to the competition of all members of the Sketch Club.

SUMMER WORK PRIZES.

The work submitted in competition for these prizes is to be delivered to the Secretary not later than Wednesday 31st October, 1906.

All drawings to be the "bona fide" work of the student submitting them, and drawings previously submitted are not eligible this year.

A prize of the value of $30 in books on Architecture is offered by the P. Q. A. A. for measured drawings of old local work.

A. Plans, Elevations and Section, preferably to the scale of ¼" to one foot, and not more than six drawings in all, of at least one old building—Farm House, Seigneurie, Civic Building, or Church in the local style of Quebec or the Maritime Provinces, with details of interesting features, internal or external, to a larger scale. Rough measuring sketches to be submitted.

B. Sketches of old furniture, fittings, etc., of artistic or historic interest.

Tracings or blueprints of the winner's principal drawings to be deposited with the Province of Quebec Association of Architects. On receipt and approval of these the prize will be presented.

BUILDINGS SUGGESTED AS SUBJECTS FOR MEASUREMENT.

The Inland Revenue Office, Place Royale, Montreal; Old Houses in Montreal, at Chateaguay, St. Geneviève, Varennes, Rosemère, etc.

Old Churches at Point-aux-Trembles, Sault-au-Recollet, St. Denis, St. Geneviève; Episcopal Cathedral at Quebec, etc.

2. A prize of the value of $10.00 in books on Architecture is offered by the P.Q.A.A. for perspective sketches illustrative of old buildings of local character. The sketches to be in any medium the competitor may prefer. The faithful representation of the building to be the first consideration. All competitors are expected to lend such of their drawings as may be asked for to the P.Q.A.A. for reproduction in the Year Book and elsewhere.

3. A prize of the value of $10.00 in books is offered by Mr. W. S. Maxwell for the best exhibit of 3 sketches done in water colour from nature, studio work not admitted, the subjects to be those in which some building or buildings occupy a place of some importance. Street Architecture or buildings with landscape surroundings are suggested as subjects.

The Committee to adjudicate upon the above competitions consists of Messrs. W. S. Maxwell, P. E. Nobbs, and J. O. Marchand.

SHOLTO SMITH, R. CHARBONNEAU,
Joint Secretaries.
5 Beaver Hall Square, Montreal, 1st May, 1906.

CORRESPONDENCE.

VANCOUVER, B. C., 16 May, 1906.

Editor, "CANADIAN ARCHITECT AND BUILDER" Toronto, Ont.

DEAR SIR,—In your description of the Linton Apartment building in the April Number, page 53, you mention the cold storage closets in the pantries. I am curious to know something about the construction of these closets and the insulation of the pipes running to and from them. I and I am sure many others of your readers, would be interested to know more about this handsome building and the interior fixtures particularly in the pantries, kitchens and lavatories, and the electric fittings for lights etc.

Another topic of interest would be the percentage paid on Eastern cities upon buildings of different classes when same are built on a percentage basis. Recently I saw it stated that on much of the day work done in the East the builder in charge received 2½ cents per hour per man employed; this amount seems very small pay for management and the use of staging, plant office work, etc. Possibly it is supplimented by a small per centage on the cost of materials purchased for the work which would be only fair as a builder's experience in buying proper materials at right prices and securing their delivery just at the right time; neither too fast or too slow; is just as valuable as the proper management of men.

Another thing which the builder should be paid for is Employer's Liability Insurance (in case he carries it of course). This costs, in this province, from 2 to 3% on the wages paid, and is usually estimated on the annual pay roll. The rate on the coast here runs from 7 to 12 per cent. exclusive of the cost of insurance, according to the size and character of the building. The percentage basis is found very convenient for jobs such as the renovation and enlarging of old buildings where it is easier to plan the work as it progresses than before its commencement as would be necessary in case it was to be contracted for. Of course much depends upon the honesty and judgment of the builder when this method of building is adopted.

Hoping you will soon have some space to spare for the discussion of the above topics,

Yours truly,
BUILDER.

OUR ILLUSTRATIONS.

GOVERNMENT HOUSE, VICTORIA, B.C.; MR. F. W. RATTENBURY, ARCHITECT, VICTORIA.

We have been furnished with neither plan of this residence nor information concerning it. The point of special interest, (besides an evidently fine site), is the entrance. The suggestion of the castle at this one point is odd, but has been accomplished with taste. The centralization of the doorway and bay window over, and the off-centre combination with this of the tower and gable, make an interesting and agreeable composition.

PUBLIC REFERENCE LIBRARY FOR TORONTO, MESSRS. WICKSON AND GREGG AND A. H. CHAPMAN, ASSOCIATED ARCHITECTS, TORONTO.

The problem in a library with reading rooms is, briefly—large and undisturbed areas which can be perpetually overlooked without requiring a special staff of attendants for the purpose. The key to the problem, in this case where there are two such areas, is an entrance near the corner. The entrance is at the outer angle between the two reading rooms, and the attendants' desk is in the inner angle. Thus the attendants are able to supervise the entrance and both rooms while discharging their ordinary duties.

The public come in contact with the attendants, or the librarian or the board room, at the point of entering the building, and need not enter the reading rooms at all until they have done all business requiring conversation and are prepared to take a seat and read.

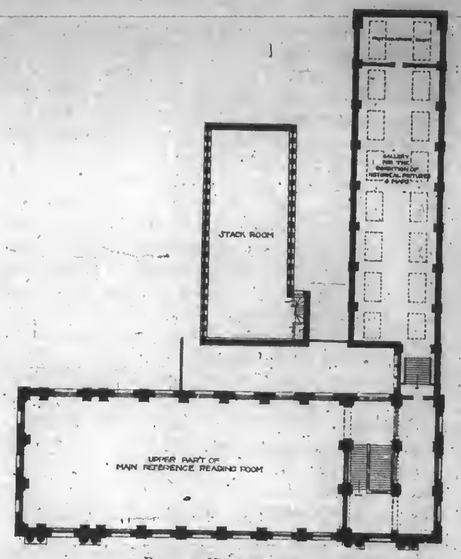
The Secretary's office, where business is done not ending in the use of the reading rooms, has a separate entrance from S. George St. on another floor, with sufficient office room to be contained entirely in that part of the building.

The Secretary's entrance is the entrance also for employees, whose cloak room, sitting room, dining room etc. are on this floor, in the rear. Their work is done (apart from the stackroom) in the two pairs of rooms that stand over and under [illegible] angle with a private stair of communication.

The books are brought in by the rear entrance at the unpacking room. Here they are checked by the invoices, entered in the accession books and labelled. The bindery next receives them to stamp the library mark in gold upon the back. Then they go upstairs to be checked again and receive the blind stamp on pages and plates. Finally, in the cataloguing room, the books are classified, catalogued and marked with the shelf number.

All this takes place in little groups of rooms between the stack room and the public rooms. It is not even necessary for the cataloguers to go outside the barrier to make their additions to the card catalogue. This will be contained in double ended drawers which can be pulled in to the cataloguing room or out to the reading room as is required.

It will thus be seen that this plan has the distinguishing mark of a good working plan—that the lines of traffic do not cross one another. It would appear from the plan before us that there is one exception in this respect. The rooms in the basement set apart for special study have no approach shown but by the private stair from the delivery room. This, which might in itself be a matter for little objection, would have in the basement the greater disadvantage that there is a quiet way out close at hand. In execution all this is being changed. The first part of the stair to the men's lavatory is being enlarged so as to be an approach to the study rooms. These will then be cut off from the lower hall so as to have no other means of access but by this stair. Thus all persons using the study rooms must, (like other readers), pass the delivery desk in coming and going.



PLAN OF UPPER FLOOR.

A reference library is essentially a place for work and the floating population of a circulating library, and the magazine and newspaper readers, are well kept outside of any access to it. The circulating library is a mere branch, and, with the periodical and children's [illegible] basement, with an entrance of its own from the street, and with no communication with the rest of the building except that there is a private door for the attendants, connecting the circulating library with the attendants' quarters.

The newspaper room which occupies part of the St. George street wing is not a room for exposing current newspapers, but the place where files of old newspapers are preserved for reference. These, which take their place as historical documents along with maps, drawings, engravings, etc., are among the most valuable records of a country. For the safety of these documents from fire the main dependence is upon the site chosen, away from the crowded part of the city, now-a-days known as the "fire zone". The building itself will have little combustible material in its construction. In a conflagration it might suffer, but apart from that—being apart that is to say, from the region where such a thing might happen—it is expected to be safe in this respect,

The stack room is made as fireproof as possible; with a protected roof, wire-glass windows, metal fittings and a single entrance with a fireproof door. Its sheltered position is also a great advantage.

On the outside we have a facade which has a full measure of the dignity which is the merit of the Renaissance. It has also, of course, the classical character-

istic of being to some extent an abstraction; a form independent of the essential construction, and capable of being rendered in more materials than one. The architects consider that their means will allow of a stone basement, brick walls and a terra cotta cornice. These—though not the white cut stone which alone seems to realize the classical idea—are reasonable and durable building materials that we shall not regard with shame.

Our drawings are reduced from the original ⅛ inch scale drawings so as to retain a definite scale. The elevations are one half that scale, or 16 feet to the inch. The plans on the illustration sheets are one half the scale of the elevations, or 32 feet to an inch. The plan of the first floor, in the text, is intermediate to the next stage, and has no scale.

It should be said that in our reproduction of the elevations we have treated the original drawing rather severely. In order to get the elevations on our page, without reducing them too much for usefulness, it was necessary to lift the actual building out of a larger area of paper in which, with the assistance of background tints, lettering and a border, it showed to better advantage than in the abbreviated form in which we present it.

HOUSES OF SMALL COST FOR A COUNTRY TOWN—NO. IV.
DESIGN BY MR. S. DOUGLAS RITCHIE, MONTREAL.

This design, made for the CANADIAN ARCHITECT AND BUILDER competition of plans for the above problem, was not placed by the judges among the prizewinners; but it is a good design in conception, and easily adapted for actual use.

The leading idea—a large living room extending across the house in one direction—is a good one. So is the simplicity of the general form of the plan. The aspect, facing the east, and a narrow lot which would preclude side windows of importance, were part of the conditions of the competition, benevolently intended to give trouble and let the competitors have an opportunity of showing their good judgement. If, however, there is an opportunity of placing this design upon a lot with sufficient freedom to the south, the living room and the bedrooms above should have south windows. It cannot be too often remarked that in this country all rooms should have south windows, when the site allows it; and all rooms should, if possible, have windows on two walls. South windows, in the winter, make the house warm; and, in summer, they make it cool. But to make the coolness perfect there should be also a window in an adjacent wall, the east or the west; or, where a room runs through the house as this living room, in both east and west walls. Rooms such as one meets with in the country—with one window which will only open at the bottom, and must be propped with a stick, and has but a six inch stick provided, and is so guarded by paper shades and lace curtains nailed across it that there is great difficulty in getting the sash up further, after the host has withdrawn, by inserting the back of the bedroom chair—these bedrooms, as a national production in architecture, are a tribute to our economy and endurance but not to our architectural sense.

Some internal changes are desirable in this plan. The larder, in the middle of the west side, is in about the worst place in the house for summer. The trouble connected with its position might be moderated by making the window small and covering it with an awning. But, if the larder is out of place on the west wall, the pantry would do there very well, and is not in a good place where it is. So it might be a good thing to move the pantry to the west, increasing its size, (which will always be a gain), so as to leave towards the east only space enough for a coat closet, opening at the foot of the stair. (Fig. 1.)

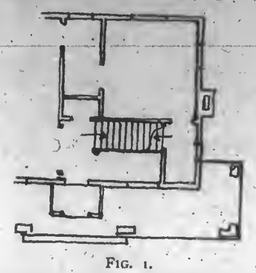


FIG. 1.

It is now necessary to spoil Mr. Ritchie's very nice hall plan by squeezing up his stair so as to get more room under the landing. The steps are evidently 7″ x 10″, which is handsome. Unfortunately 7½″ x 9″, which is much less handsome, makes a very comfortable stair; and by its help we could get a larder under the landing which, if the way to the cellar opened out of it—which would be quite in the cottage style—would be roomy enough for the purposes of housekeeping on this scale; and with a north window, it would be not badly placed. The way to the cellar from the hall is of course is gone, but that is not a first essential in a no-servant family where the master of the house not only *may* seek the society of the cook but *must*.

Another way would be to block up the rather doubtful archway to the living room by a partition, making an ordinary door in it near the east wall, and starting the stair with winders against the partition. The handsomeness of the hall would then be transferred to the landing; and there would be room under it for a cellar separate from it, and a coat closet on the hall side of the larder.

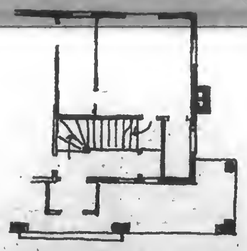


FIG. 2.

All this is more or less murder; and it is a pity to lose the front way down to the furnace, for this would make a very good house for a small family with one servant.

It would perhaps be best to leave the hall alone, except for filling up the archway and having a door instead—placed opposite the stair so as get away from the front door.

Let us, however, still pursue the search for a north-east larder and a pantry with a window in the outer wall. One begins to tremble before the classic inviolability of this plan; but there is one point in which it is perhaps a little too classic for the kind of house. The verandah need not return at each end in the same manner, and we may project our larder to form a solid end on the north, under an extension of the verandah roof. In this way we leave the hall and cellar passage intact. The spare space at the east end of the pantry would make a cupboard—a most useful adjunct—for the living room.

The verandah is undoubtedly a great feature in the design, but it is not likely to be built with brick arches, as drawn. It is worth noting therefore, as a question, whether the roof is not really the essential element in the effect, and whether the oblong brick piers do not show up in the perspective as being, if not too heavy for the house, at any rate unnecessarily heavy. It is partly a matter of the narrowness of the verandah, (which ought to be wider), and partly a consequence of the severe training to which we have been subjected all our lives, in the matter of skimpy building, which has accustomed our eyes to the smaller diameter of wooden posts in a verandah. Fourteen inch brick piers in this case, with a plate consisting of a pair of joists set apart on the outer edges of the posts, would be substantial beyond the ordinary.

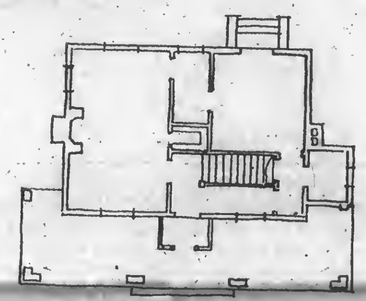


FIG. 3.

One thing the perspective does show:—that the eaves of the house would bear lifting. The attic would be better for it; for, as drawn, there appears to be no more than 4 ft. vertical wall height, inside, at the plate. Another two feet inserted below the attic window sills, which do not appear to be more than 18 in. above the floor, would both help the attic and make a wider verandah roof possible. Even though the relation between the eaves and the apex of the verandah roof were unchanged the eye would acknowledge the extra altitude of the wall, and the building would probably get more of the snap of the elevation. But a verandah half as wide again would not, with the same pitch, rise more than a foot higher on the wall.

The St. Johns Brick Company, Limited, has recently been granted incorporation to purchase and acquire the business of St. Johns Brick Company, manufacturers and dealers in brick, St. Johns, Que. The headquarters of the company will be St. Johns, and the capital $75,000. Among the promoters are Messrs. Joseph Simard, Ulric Normandin and Alfred Simard.

The expansion of building operations in all parts of the country has so increased the business of W. H. C. Mussen & Company, dealers in railway and contractors' supplies, Montreal, that they have been compelled to extend their premises. They have purchased the large warehouse situated at Nos. 21 and 23 Colborne street, Montreal. This will give them excellent facilities for handling their goods, as the new warehouse faces the canal, and has railway sidings within 190 feet of the goods entrance.

ILLUMINATION.

By ERNEST C. WHITE, Member Illuminating Engineering Society.*

In commencing a series of articles on Illumination, it is not the writer's intention to indulge in rhetorical generalities on the universal importance of light. A clear, and, it is hoped, an instructive description of a lighting problem and its solution will be presented in each paper, and it is only as an aid to the more thorough appreciation of these problems that an outline classification of the more important considerations in illuminating work is given below.

It is realized that, to the Architect, the problem of lighting design easily resolves itself into the architecture of fixtures and their supports, plus—some estimate regarding the light sources needed to produce the desired (more often *a desirable*) illuminating effect. Various rules have been employed to arrive at the number and size of lights; and judgment, good and bad, has been exercised in the disposition of these sources. But judgment is haphazard unless based upon accurate information, and a simple examination will prove the foundation of most "rules" of lighting to be somewhat less reliable than shifting sand.

What is meant by a "16 candle power" lamp? The ordinary incandescent lamp of this rating gives less than 7 candle power in the direction of the tip. The lamp is rated at its maximum candle power, which is in a horizontal direction, the lamp being pendant. Some manufacturer makes a lamp giving about the same total flux of light and equips it regularly with an accurately designed reflector. This is rated as a unit at the maximum candle power in any direction. The direction may be in line with the tip and the candle power may be 50, and a result more suitable to the particular need might be obtained with the ordinary incandescent lamp fitted with the proper accessories. In each case the rating means less than nothing, for it is misleading.

What is a "110 volt" lamp, and where should it be [illegible] turer, it is a lamp that will give its rated candle power horizontally on a certain consumption of current for about a certain number of hours across a 110 volt circuit. If this lamp is put on a 104 volt circuit it will give only 11.5 candle power and will consume 24% more watts per candle power. The voltage varies in nearly every installation and where the lighting companies do not supply renewals, the dealers stock lamps for the nominal voltage of the circuit. The customer can get nothing else and pays, in many cases, 25% too much for the light produced. I would say "for the light used", but the production and utilization of light are two very different things.

What becomes, then, of the rule that specifies so many lamps of a certain candle power for a room of given dimensions? The discrepancies resulting from unscientific lighting become much more apparent, however, when we begin to investigate the different effects produced by the use of various reflectors, globes, etc., with the same lamp. It is a very common error to suppose that a given quantity of light will produce approximately the same average illumination in a given space, no matter how distributed. This is not true even though the pigment and color of walls and surroundings be the same. The

*Engineering of Illumination, Aikins Building, Winnipeg.

efficiency of the best ceiling reflection is very much below that produced by reflectors that give a predeterminable distribution. The benefits accruing from the skilful use of accurately made accessories will be illustrated in the succeeding articles of this series.

The above remarks have touched only one form of electric lighting, but like considerations obtain in the use of any illuminant. It is necessary to know the quality and pressure of gas in the mains and to insure known conditions at the outlets. Inverted gas burners have entered the field, with many imperfections it is true, but offering a wealth of possibilities when properly used. Various forms of gasoline vapor and acetylene lighting must be considered in their place. Vacuum tube lighting and Nernst lamps have their peculiar characteristics and efficiencies. The luminous arc has appeared as a formidable competitor with the enclosed arc for some purposes only. Is the architect to take a centractor's advice in such a field as this, or, on the other hand, to protect himself by putting in an abundance of light sources? Is he really alive to the fact that the efficiency of lighting equipment must be measured in its operation.?

In order that succeeding examples may be perfectly understood a few remarks on the physiological side of illumination will not be out of place. It is very commonly considered that incandescent lamps are hard on the eyes, and probably no other illuminant has suffered so bad a reputation in this respect. But neither has any other form of lamp been so easy to hang in front of the eyes and in positions impossible for a gas or oil lamp. The bare filament of a 16 candle power incandescent lamp has an intrinsic brilliancy of some 50 candle power per square centimeter, and should never be allowed in the line of direct vision. Not the least among the economies of good lighting, is that obtained by keeping the eye of the observer sensitive to the actual illumination through the avoidance of eye strain, and this is said without reference to the tremendous human economy in eyesight itself.

If the foregoing shall have created any impression that economy in lighting must be obtained at a sacrifice of decorative requirements, this should be corrected. True art may at least conform to essential mechanical requirements, and the limitations imposed by these are not so narrow as might be supposed. In view of this the eminence of some mistakes is remarkable. I will quote the words of Dr. Louis Bell before the Illuminating Engineering Society:

"One does not have far to go to see some horrible examples of inartistic and thoroughly bad illumination. Sometimes this is noticed and remedied; sometimes it is not. The delivery room in the public library in the city of Boston in its early stages was perhaps the most shining example of the malapplication of light that I have seen. In that room the mural paintings are sunk into deep panels, the reason for which I have been unable to discover. That room was originally lighted by two gigantic chandeliers which came down one-third of the way to the floor, and were dotted with incandescents, entirely defeating any object of lighting up the mural paintings and in fact preventing anybody from seeing them. That was finally remedied, but even when it was done, it was not done well. If you will go there to-night you will find that the lights intended to illuminate the paintings are not so directed that they do it to the best advantage, for the very simple reason that the scheme of decoration which had been adopted for the room, utterly irrespective of the possibility of having paintings there which anybody might want to see, was such that it did not seem wise to put the lights where they would do any particular good. It is that sort of thing which ought to be given a great deal of careful attention. We want to know not only how to get good light for general illumination, but how to use it for particular illumination, as in a case of that kind, with the best benefits possible."

It is true that many artistic features have been "designed", which seem in every way beautiful until their utter uselessness as a support for light sources is understood. But these things are passing. Some day the fixture designer will judge the beauty of his appliance by its purpose, to the same extent that an Architect feels intuitively as well as intelligently the relation between the shape of a beautiful arch or column and its ability to support a load.

MONTREAL NOTES.

The special committee of the Province of Quebec Association of Architects which has been appointed to deal with civic improvements has prepared a sketch plan embodying a number of suggestions the general aims of which are, first, a better communication for heavy traffic between the up-town and down-town sections of the city and, second, the formation of a number of fine avenues forming uninterrupted circuits and connecting the principal parks and open spaces. This plan is a tentative scheme prepared with a view to inviting a more thorough and general discussion and consideration of the question. When the details of the projects which meet with most acceptance and are felt to be most urgent have been discussed, the Civic authorities will be invited to take action. It is the purpose of the Committee to increase its influence by adding to its members, as associate members, such influential citizens as they can find a means of furthering their aims. With a view to extending interest in the subject a meeting was held, on Friday, 1st of June, at the Beaver Hall Square rooms, at which Prof. Nobbs presided, and to which were invited members of the Board of Trade and a number of other influential citizens. Amongst those present were Messrs. H. V. Meredith, John Dougall, L. J. A. Surveyer, H. Godin, J. O. Labrecque and Fortunat Bourbonéire, Professor Cox and ex-alderman Robertson. In its present form the most expensive item of the scheme is the suggested formation of two diagonal roads from about Victoria Square to St. Catharine Street in such a manner that the one going to the right hand and the other to the left they could form a means of arriving at the up-town section without the necessity of climbing the very abrupt and difficult Beaver Hall Hill. It is claimed that such roads could be formed almost entirely through districts consisting of the poorest sort of property, and that the enhanced value they would give to the property traversed would speedly repay their construction. A good prima facie case can be made out for the scheme, and, if any one thinks he can make out a better, now is the time for him to make his suggestions.

There is a considerable inclination just now to experiment with reinforced concrete construction on a large scale. This is of course partly due to the present high rate for fire insurance, which can in this manner be minimised. Contractors who make a specialty of this material are also apt to tempt clients with promises of comparatively small intial cost, which are probably not always fulfilled when contracts are drawn up in black and white. Contracts have however been signed by the Dominion Engineering and Construction Co., of Montreal, to erect of re-enforced concrete a set of buildings for the American Tobacco Co., Ltd. of Canada, on the ground between St. Antoine, Bourgette and Anne streets. Completion in five months is called for.

The contract for the new seven storey building for the Montreal Light Heat & Power Co., at the corner of Craig St. & St. Urban St. has been let to John Quinlan & Co., of Montreal. The facework is to be of Indiana limestone with a base of Standard granite. The fourth, fifth and sixth storeys will be let as offices, the others will be occupied by the company.

The Year Book for 1906 of the Province of Quebec Association of Architects has now been issued. It includes as last year an account of the constitution, membership and proceedings of the Association, the Library Catalogue, Code for Conduct of Competitions, Statement of the Professional Duties of an Architect. Of these the Code for the Conduct of Competitions is indexed under the surely rather broad title of "Code of Ethics" which would more properly apply to the Statement of the 'Professional Duties of an Architect.' Both these statements, by the way, are well worthy the perusal of all architects and of those who employ them, The new matter contained in this the second issue of the Year Book comprises the Reports of the Quebec section of the Association, the regulations for examinations and the questions set, presumably during 1905, with recommendations as to the books suited for study in Connection therewith, a paper on Reinforced Concrete read before the Association by A. Loignon in Nov. 1905, an account of the Sketching Club of the Province of Quebec Association of Architects, list of Student Associates, and a statement regarding the forthcoming International Congress. Under this last heading is included an account of the Royal Institute of British Architects not separately classified in the index. This should be of special interest to students of architecture as it includes particulars of the Colonial examinations to qualify for Candidature as Associate R. I. B. A., and also gives information regarding the various medals and studentships in the gift of the Royal Institute which are open for the competition of all British subjects. The reproduction in this Year Book of a number of illustrations of old buildings of the Province of Quebec prepared by members of the Sketching Club is an interesting feature. Whilst this volume is a distinct advance on its predecessor, it might be still further improved by the introduced of more papers read before the Association, such as that of Mr. Loignon's, and by increasing the number of the illustrations.

NOVEL SASH BALANCE.

A novel device for balancing the weight of window sashes has appeared in the hardware trade. It is a spring roller held in brackets at the highest point of the sash slide. Two screw-eyes are placed in the top of the sash, to which are connected belts from either end of the roller. The screw.eyes can be raised or lowered to equalize the belts on each side. If a different tension is desired, one belt at a time can be taken off and either wound or unwound on the roller. These belts are attached to the eyes by means of hooks fastened to the ends of small brass straps, the belting being connected to the roller by means of other brass straps locked in grooves.

The Mira Brick Company have decided to make extensive improvements to their plant. A new kiln, costing about $5,000, is to be installed, giving the company an output of 20,000 bricks per day, or about one million five hundred thousand bricks per season.

DETAIL AT ENTRANCE OF CENTRAL METHODIST CHURCH BLOOR STREET EAST TORONTO.—ERECTED IN ROMAN STONE.—G. M. MILLER & CO., ARCHITECTS.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Builder": In the building of small church—Episcopal—in a country village, would you advise me to build in stone (sample sent) or in brick? The stone can be obtained close by the work, and there are no bricks to be had within a radius of 25 miles, so that the cost will be about the same in either case. Please advise me through your journal, also give me your idea

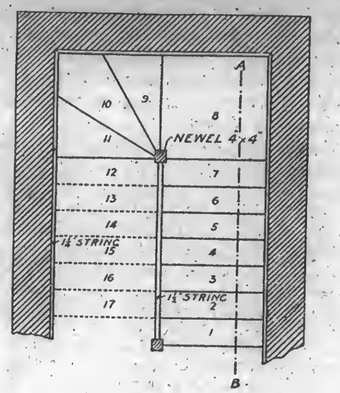


FIG. 1.

as to the wearing qualities of the stone, sample sent you?

ANS.—The choice of a suitable stone is of very great importance to all who are interested in building work, and careful attention should always be given to the subject. We have seen a comparatively new and

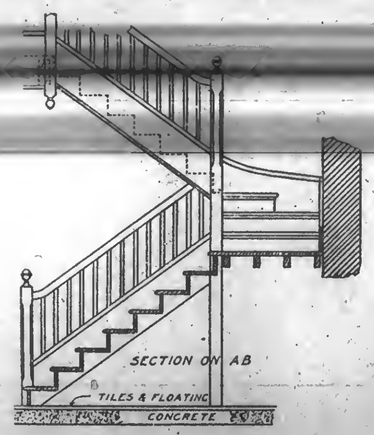


FIG. 2.

exceedingly costly building, in the construction of which stone from a quarry of good reputation was extensively used. The stone proved to be very absorbent of moisture, and this caused it to weather badly, losing its face season by season and spoiling the appearance of the building; but more than this, the moisture was conducted quite through the walls, and rotted the ends of the timbers which they supported, letting down floors and ceiling, and destroying cornices, and so necessitating extensive repairs in addition to the substitution of sounder stone. Not only do stones from different localities exhibit very different weathering qualities, but apparently similar stones from different beds in the same quarry exhibit differences equally great. The experience gathered by constantly noting the behaviour of different stones and of the same stone

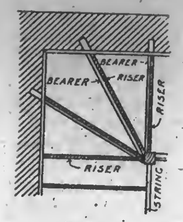


FIG. 3.

under varying conditions is the only sure guide. The sample of stone sent is rather a poor example of sand stone, and is very absorbent. We do not think this stone will weather well as both wet and frost will cut on it and finally destroy it. If, as you say, the cost will be about the same, we would advise you to use good hard bricks with trimmings of Port Credit stone.

From "Young Carpenter". Will you kindly show how a dog-legged stair to go between two walls six feet apart should be constructed, giving such details and explanations as you may think necessary?

ANS.—The term Dog-Legged implies that the second flight returns in a direction contrary to the first, without leaving any space between them; Figs. 1, 2 and 3 are plans and sections of such a stair.

The treads are horizontal boards on which the foot is placed. The risers are the vertical boards between treads. The nosing is the projection of the tread at its [illegible] series of steps between two landings. The going is the horizontal distance between the fronts of two consecutive risers, and should not be less than 9 inches.

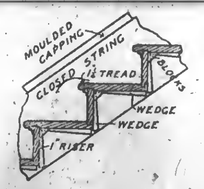


FIG. 4.

The rise is the vertical distance between two consecutive steps or treads, and should never be more than 7½ inches. The pitch is the angle at which a flight rises. In Figs. 2 and 4 the stairs are constructed by housing the treads and risers into an outer string, the latter of which is nailed to plugs driven into the brickwork. The housings in the strings are made wider than the thickness of the tread and risers, so that wedges coated with hot glue may be driven into the joints. The riser is housed or rebated and grooved to the treads above and below it, and the upper joint is

strengthened with glued blacks, Fig. 2. A closed string has its upper and lower edge parallel, and is usually finished with a moulded capping grooved and tongued on; the capping to the outer string carries the balusters which support the handrail. A cut string is shown in Fig. 5. The treads then line on the horizontal part of the cutting, and the risers are mitred to the vertical part. The nosing to the tread is returned along the end of the tread, and often has beneath it a bracket planted on; the bracket serves no purpose beyond that of ornament. When stairs are over 3 feet in width, a "rough string" or "carriage" is used to

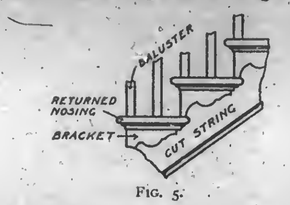


FIG. 5.

support the middle ot the tread and risers; and rough brackets, as in Fig. 6, are nailed to the carriage for this purpose; apron linings may then be needed to conceal the carriage; the creaking of stairs often is owing to the absence of a rough string. Where winders are used "rough bearers" take the place of carriages in supporting the risers, and in Fig. 3; they rest in the wall, and are framed to the newel. To economize space in small houses, it is not uncommon tor stairs to rise in one flight between walls, with winders at the head or foot; both strings are then plugged to walls. This description and diagram covers all ordinary stairs.

From "Mason": Please explain what is meant by "Coursed Header Work" in stone masonry, and the manner in which it is constructed and oblige?

ANS.—"Coursed Header Work" consists in having the stones all properly squared and the headers run the entire depth of the course as shown in Fig. 7. Perhaps the following remarks by Professor Ramsome, along with the diagram, will explain the matter much

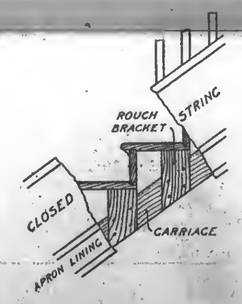
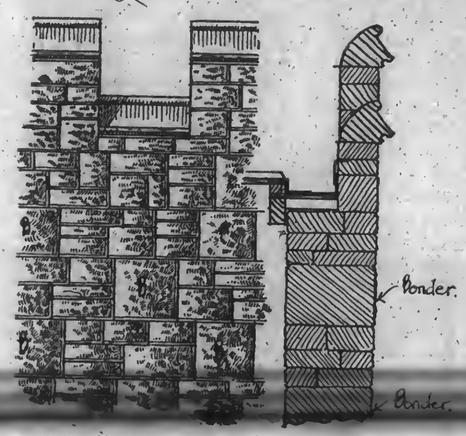


FIG. 6.

better than we can. The professor says: "One-fourth part at least of the face in each course should consist of bond stones or headers; each header to be of the entire depth of the course, of a breadth ranging from one and a half times to double that depth, and of a length extending into the building to from three to five times that depth, as in ashlar. These headers should be roughly squared with the hammer, and their beds hammer dressed to approximate planes; and care should be taken not to place the headers of successive courses above each other, for that arrangement would cause a deficiency of bond in the intermediate parts of the course. Between the headers each course is to be built of smaller stones of which there may be one, two or more in the depth of the course. These are sometimes roughly squared, so as to have vertical side joints; sometimes the stones are taken as they come, so that the side joints are irregular; but no side joints should form an angle sharper than 60 degress. Care should be taken not only that each stone shall rest upon its natural bed, but that the sides parallel to that natural bed shall be the largest, so that the stone may be flat, and not be set on edge or on end. Howsoever small and irregular the stones may be, care should be taken to make the courses break joint. Hollows between larger stones should be carefully filled with smaller stones completely imbedded in mortar."

From "Builder."—I desire to finish a large room with a dado in cement. Dado to be of a warm red



Coursed Header Work.

FIG. 7.

color when finished, but the walls are not to be painted. Please describe a good method for executing this kind of work?

Ans.—If a granular surface is required, first coat the walls with portland cement and sand, and when set float with colored Portland cement and sand, 2½ to 1, working to a uniform face with a felt covered or cross-grained float. For a smooth or polished Portland finish, float the work, keying the surface well by using a coarse broom, and finally finishing with lime putty 2 parts, Portland cement 1 part, mixed with colored water made by dissolving 1 stone of red oxide in a large pail of water. For a Keene, Parian or chromolith finish float the surface like the last, finishing by using three cements gauged with the colored water. The two latter processes when laid are gently scoured with a cross-grained float, filling in any slack places, until brought to a true surface; then polish with the laying trowel, and finally polish with felt or flannel. Fresh air-slaked cements must be used, so that the setting property of the cement may not be destroyed by the coloring matter; also the different gauges of material and color must be noted and maintained throughout to the completion of the work. A uniform colored surface may be ensured by keeping a test piece.

SHINGLE STAINS.

It sometimes happens that a well planned house is spoiled in the making by some oversight or makeshift, or an artistic exterior spoiled by the color placed on it, for the reason that the architect may not have specified just what was wanted or has allowed the contractor to use something "just as good", or both architect and builder have been unable to obtain the material wanted.

We have been doing some investigating to see why the colors on so many roofs and gables seem to go to a frazzle and become old before their time. Sometimes a single winter takes the life out of a stained roof and leaves plain, bare wood in spots. Then somebody is blamed because the roof is an eyesore.

A stain should not be paint, the difference being that a a stain enters into the material to which it is applied, while a paint remains on the surface. Stains are applied to undressed wood which has not been treated in any way and which presents what might be called a raw surface, while paints are applied to a wood which has been primed or filled, so as to prevent the paint from sinking in. In fine wood finishing when a stain is to be applied to a hard wood in order to show up the grain, the wood is first "filled", then the stain is applied with a brush, but all the superfluous color is rubbed from the surface with a cloth, leaving only such color as has entered into the fibre of the wood. This is not the case with stains applied to shingles or sidings.

Stains consist of two parts, the color, and the vehicle which carries the color, and perfection in one part is as essential to a good stain as perfection in the other.

In many cases the stain for a roof or siding is made by the workman on the job by rule-of-thumb. A certain quantity of cheap adulterated dry color or pigment is mixed with some mineral oil and benzine, and is applied to the wood. The vehicle promptly sinks into the wood, while the coarse color stays on top. We tried this and found that when this alleged "stain" had become perfectly dry and hard, we could scrape all the color from the surface with a dull knife or scraper. The cheap dry colors usually employed have a perceptible grain and feel like fine sand between the fingers, and, in some cases, like coarse sand. These particles of color will not break up or dissolve in the vehicle without grinding, excepting to a very slight degree, and as these particles are of a larger size than the pores of the wood, they have, of necessity, to remain on top while the liquid part only goes into the fibre. It is the old story of a two inch plug not going into a one inch hole, no matter how much lubricant is used.

Therefore, colors for stains must be ground even finer than for paints, and as a stain must not cover up the effect of a wooden surface but simply give it color, the color used must be absolutely pure and without adulteration. Any color adulterant used would simply fill up the fibre of the wood without staining it, and would, to just that extent, destroy the character of the finished surface. Therefore, the purest, strongest colors make the best stains, because the stronger the color the less the quantity required to produce the result.

The fading or the unfading property of a color is by no means a small factor in the making of stains, particularly those to be applied to exposed surfaces, such as roofs or gables. Certain kinds of reds, greens and other colors will be affected by light to an almost imperceptible degree as compared to those which may have the same general appearance, the difference being in the chemical composition of the color. The color or pigment for a shingle stain must, therefore, be one showing the maximum resistance to sunlight.

Stain for roofs, gables and sidings are used as beautifiers, and it follows that all colors, shades and tones should be soft and harmonious, and that all harsh, heavy and severe effects should be avoided.

As the pigment used in the stain is for the purpose of filling and giving an artistic color effect to the wood, it necessarily follows that the remaining value of a shingle stain is in the vehicle. This vehicle must be thin enough in its consistency to enter readily into the wood fibre; although of thin consistency, it must still have a sufficient degree of body to hold in suspension the coloring matter in a uniform manner; it must have the property of drying with uniformity in the right time, and thoroughly, so that it will not run or bleed; it must have sufficient of the wood-preserving property to prevent the formation of fungus growths and the burrowing of insects, both of which open the way for the entrance of water and ice, and the consequent cracking, warping and final destruction of the wood; and it must have binding property to thoroughly unite and bind together all the elements of vehicle and color in order to produce a homogeneous mixture and a resulting satisfactory product.

The absence of any one of these properties is practically fatal to the life of the stain and of the wood, and, furthermore, a stain might contain all these properties and yet be lacking in value, due to the percentage of some one or two of the ingredients being too high or too low. It is impossible in this article to go into the details of percentages and materials necessary for the production of a thoroughly practical and effective shingle stain, for even with these details, the mechanical and practical knowledge of method in producing the combination cannot be transmitted, and, furthermore, the chemical properties of the various colors used make it necessary to vary the percentages of the vehicle.

While great care is taken in the selection of a proper paint for a building, both interior and exterior, the selection or making of a stain for the roof and gable, where the exposure is greatest, is often left to the carpenter. The obtaining of a stain with the requisite penetrating and preserving quality, as well as the selection of the colors, is second in importance to no other work about a house. The reason stains are not used in relatively as great quantity in this country as in the United States is owing, primarily, to the indifference which has been shown by the property owners in demanding an article possessed of proper merit, and, secondly, to the poor results which have been obtained from the methods in vogue. Much more outside staining will be done than at present if the results of properly stained and protected wood by the use of proper materials are more frequently seen.

Our investigation proves to us that the making of a high grade stain is a scientific piece of work, that its admixture must be in the hands of thorougbly practical men, that cheap materials make cheap products, and that the off-hand rule-of-thumb substitute is an expensive expedient in the long run.

A gothic roof of reinforced concrete has been built for a church in Belgium under the direction of Messrs. Aronstein and Luder of Brussels. It has a central span of 23 ft. and side spans of 11½ ft. The concrete is covered with mortar and plaster moldings.

BUILDING IN HAMILTON.

Thus far the building season of 1906 has been one of great activity in Hamilton. Whilst it may not be ahead of last year in the number of buildings being erected, yet the work of this year is of a superior character, and it is thought that the cost will total an amount equal to, if not greater than that of 1905. There is considerable increase in the cost of building this year, and this has had a tendency to lessen the amount of work done. Still contractors report that they are kept very busy.

Solid brick is the popular style of construction for dwellings, there being very few brick veneer or cement houses erected.

The majority of dwelling houses range in price from $2,500 to $5,000, which seems to meet the requirements of persons of moderate means. A pair of semi-detached, two and a half story dwellings, on Main street, built by Mr. George J. White, contractor, afford a fair specimen of this style of house. Each contains nine rooms and all modern conveniences. They are neatly finished th o ughout and possess all the requirements for cozy homes.

Of residences of a more expensive nature, a fair type s one being built on Ravenscliffe avenue, of which Mr. Stewart McPhie is the architect. This consists of two stories and attic, and is constructed of brick with stucco finish. Mr. E. B. Patterson, who has designed many dwellings this season, gives another good example of this style of building in a modern brick residence being erected on Barton street. Mr. McPhie has also planned a fine residence for Hannah street to cost about $15,000. It will be constructed of pressed brick with cut stone trimmings. The Vineyard Hotel, a modern three story brick structure, on Main street, was also planned by the same architect.

Besides the great number of dwellings, there are many stores, office buildings, warehouses and public buildings being erected, also many buildings undergoing extensive alterations. The Twentieth Century Club, on Locke street, has just been completed. It was designed by Messrs. F. J. Rastrick & Sons. It is a two story building, 73 feet in length by 40 feet wide with flat roof, pressed brick front, stone trimmings and galvanized iron cornices. The lower story contains two stories and in the second story are the club rooms.

Several new churches are included in the list of buildings this year. A small church in the east end park, of which Mr. Rastrick is architect has been completed recently. It is a neat building, of Gothic architecture, constructed of brick. St. Andrew's Presbyterian church, whose corner stone was laid a few weeks ago was planned by Messrs. Stewart & Witton. It will be of Gothic architecture and constructed of brick and stone. The site is at the corner of Smith and Barton streets. The first installment of fine church buildings for the Barton street Methodist congregation is the new Sunday school now in course of erection. It was planned by Mr. W. A. Edwards. It will be built of brick at a cost of $12,000. It is to be followed later by the main church building. One of the finest examples of cement concrete work to be seen in the province is St. Anne's Roman Catholic church on Sherman avenue. It was designed by Mr. Robert Clohecy. He is also the archi-

The Standard Ideal Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QUALITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTATION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

tect for St. Patrick's Presbytery building, at the corner of Main street and Victoria avenue. The material for its construction is Bedford Indiana stone. It will cost about $18,000. The Gospel Tabernacle is of Grecian architecture, constructed of brick with stone trimmings. The interior arrangement is of amphitheatre style. The galleries are carried on plate girders, which are hidden from view. Mr. Charles Mills is the architect.

The new theatre being built on Merrick street was designed by Messrs. Stewart & Witton. It is of Modern French architecture, 128 feet long by 52 feet wide. The lower story is built of stone and the upper portion of brick and stone.

The Wentworth street school building and the patrol station are also being built from plans by these architects. The latter building will be located on May street and will be constructed of brick and stone. The school building will consist of a brick addition comprising eight rooms and will cost $30,000.

There are some good examples of warehouses and factory buildings in course of erection. A large warehouse on Vine street for Mr. G. Hill was planned by Messrs. Rastrick & Sons. Originally it was intended to have a four storey building, but latter it was decided to make it eight stories. It will be construted of cement blocks. A three story brick building for the Jackson Visible Typewriter Company has been designed by Messrs. Stewart & Witton. Mr. A. W. Peene is the architect for the Coppley, Noyes and Randall warehouse. It will consist of four stories and basement. Pressed brick is the material. The Otis Fensom Elevator Company have had large additions made to their building at a cost of $35,000. These consist of a two story machine shop, a wood-working shop and a fire-proof pattern vault of re-inforced concrete. The Sawyer and Massey Company are also enlarging their premises by the addition of a two-story fire-proof building of re-inforced concrete. Mr. Edwards is the architect. The Eagle Spinning Mills to be erected at the corner of Wilson and Sherman streets were planned by Mr. Charles Mills. These buildings will be of concrete construction throughout and will consist of a three story building, 135 feet long by 106 feet wide, and a warehouse 125 feet by 35 feet.

The Bank of Hamilton building is being extensively remodelled according to plans prepared by Mr. Mills. When completed, it will be practically a new structure. The plans call for a nine-storey, fireproof building in the Italian Renaissance style. The two lower stories will be constructed of stone. For the next five, New York hydraulic pressed brick with stone trimmings will be used. The eighth and ninth stories will be of carved stone. The estimated cost is about $300,000. The Federal Life Assurance building was described in our last issue and requires no further reference.

TRADE MARK
"B" BRANTFORD ROOFING CO. LIMITED
BRANTFORD, ONT.

WROUGHT IRON FENCE

Make a Neat Appearance, Form a Perfect Protection and will last a Life Time

Designs from $1.00 a foot upwards. Send for Bulletin No. 23

CANADA FOUNDRY CO., Limited
Head Office and Works: TORONTO, ONT.
District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

STANDARD SANITARY MANUFACTURING COMPANY, TO ERECT A PLANT IN THE EAST.

The interesting announcement is made that the Standard Sanitary Manufacturing Company, Pittsburg, Pa., manufacturers of the celebrated "Standard" porcelain enameled baths and sanitary goods, will this year erect a large modern plant for the manufacture of these goods in the East. Land has been acquired at East Camden, N. J., directly across the Delaware River from Philadelphia, and a factory, designed upon the same elaborate scale as the great plants at Allegheny, Pa., New Brighton, Pa., and Louisville, Ky., will be constructed. The new works will be completed this year, and will employ in the various departments about 1,000 hands. The cost of the plant will be approximately $500,000.

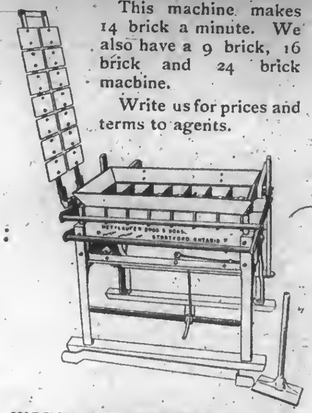
The most thorough and elaborate mechanical equipment will be installed in the new factory, in order to facilitate the various processes of manufacture, and produce goods of such noted quality as has long been indicated by the name "Standard" as well as to ensure the prompt execution of contracts. A full line will be manufactured including the various types of bath tubs in all sizes, lavatories in the different designs and sizes, sinks and laundry trays, closet bowls and tanks, urinals, drinking fountains, wash sinks and other articles used in plumbing and sanitary installation.

The erection of a factory in the East was found to be an imperative necessity, owing to the enormous trade which has developed by the company in the large cities of New York, Philadelphia, Boston, Baltimore and other centers. The company's export trade also has grown to such large dimensions that it was found by locating a plant near the seaboard, great savings could be effected in freights as well as raw materials, and deliveries could be made more promptly and satisfactorily. The new plant will therefore be a great convenience to the Eastern trade, as when the factory begins operations the goods can be secured quickly, and delays unavoidable in the case of long shipments will be obviated.

The company was the first concern in the world to successfully attempt the enameling of cast iron sanitary articles with a powder (known as the "Dry Process") instead of applying the preparation in liquid form by the "wet process". Indeed the Standard Sanitary Manufacturing Company was the first concern in America to manufacture enameled baths and sanitary goods successfully at all, and prior to the advent of this company in the field, the public had no faith in the porcelain enameled bath and wash stand. Other manufacturers had attempted to produce these goods, but the enamel would crack and craze, the casting was rough and clumsy in appearance and invariably any enameled goods sent out would be returned. Along in the 70's the Standard Sanitary Manufacturing Company began a series of experiments to learn the secret of the manufacture of perfect porcelain enameled ware, and by persistent efforts, succeeded in devising means and methods of manufacture that have never been equaled.

While the plant at East Camden will not of course be able to supply the company's eastern trade, the output, will relieve the other factories, and will enable a more satisfactory distribution of the products. So large a business has been developed in the Western States and on the Pacific Coast that at the present time a considerable proportion of the output of the three big factories is sent to that point.

"Lightning" Cement Pressed Brick Machine



This machine makes 14 brick a minute. We also have a 9 brick, 16 brick and 24 brick machine.

Write us for prices and terms to agents.

WETTLAUFER BROS. & SONS
Manufacturers of
Pea Harvesters, Mangle Leaders, Buncher, Hay, Grain and Stock Racks, Washing Machines, Wagon Boxes, Scrapers, Wheelbarrows, Etc.
STRATFORD, ONT.

ARCHITECTS!

SPECIFY — SPECIFY

LUXFER WINDOW PRISMS

LUXFER SIDEWALK PRISMS

LUXFER FIREPROOF GLASS

Do not fear a little expense for good material.

It will pay you in the long run.

Your work is more satisfactory to your client and he is better pleased with what he has got.

Write us for prices or other information.

MARBLE MOSAIC FLOORS

GLASS MOSAIC WALLS

ART GLASS

Luxfer Prism Company, Limited
100 King Street West, TORONTO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
Room B, 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	JOHN E. BELCHER, Peterborough
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1905.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. H. VANIER, "
TREASURER	J. R. GARDINER, "

COUNCIL.

J ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—L. LEMIEUX AND P. E. NOBBS.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.	H. MARTIN.
THOS. W. SELF, 1st Vice-President.	THOS. CHRISTIE.
C. W. BATT, 2nd Vice-President.	J. R. HOIDGE.
JAS. CRANG, Treasurer.	JOHN ALDRIDGE.
	JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.	J. JONES.
JNO. WHITTAKER, 1st Vice-President.	CHAS. GOULD.
GEO. HYATT, 2nd Vice-President.	T. WRIGHT.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.	H. STRATFOLD.
	A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.	C. P. SHINDLER
R. A. CARTER, Secretary.	K. M FEASE
H. A. BELL, Treasurer.	E. G. BAINE
T. BRADERY	D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

A. T. DAVIDSON, President.	A. H. PORTER, Secretary.
J. W. MORLEY, 1st Vice-President.	T. D. ROBINSON, Treasurer.
T. R. DEACON, 2nd Vice-President.	

Directors: Thos Black, Jos. Bourgeault, E. Cass, D. Cameron, V. L. Bouch, Wm. Alsip, Ald. J. G. Latimer, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. F. Alsip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.	JOHN DUTHIE.
JOS. O. DESLAURIERS, Vice-President.	JOHN L. HARRINGTON
J. HERBERT LAUER, Secretary.	JOHN GRAY.
N. T. GAGNON, Past President.	ALEX. BARMNER.
W. E. RAMSAY. J. LEFEBVRE.	J. N. ARCAND.
W. B. SHAW.	JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WEITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICALE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHAPENTIER, Jr., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUS, Treasurer.	E. Z COTE.
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

LOW SUMMER TOURIST RATES WEST.

During the entire summer the Chicago and North Western Railway will have in effect very low round trip tourist rates to Colorado, Utah, California, Oregon, Washington and British Columbia points. Choice of routes going and returning with favorable stop-overs and time limits. Very low excursion rates to the Pacific Coast from June 25th to July 7th. For further particulars, illustrated folders etc., write or or call on B. H. Bennett, General Agent, 2 East King Street, Toronto, Ont.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

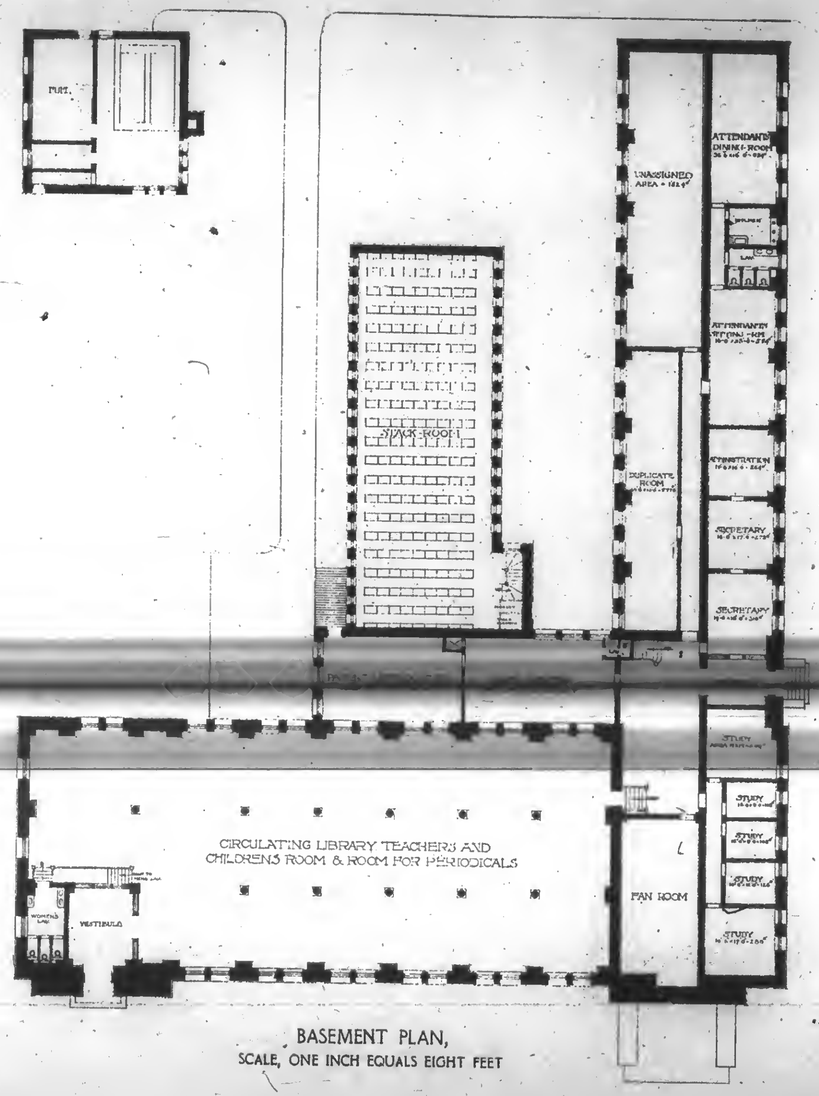
IN ARCHES, BLOCKS AND FURRING

in any required size.

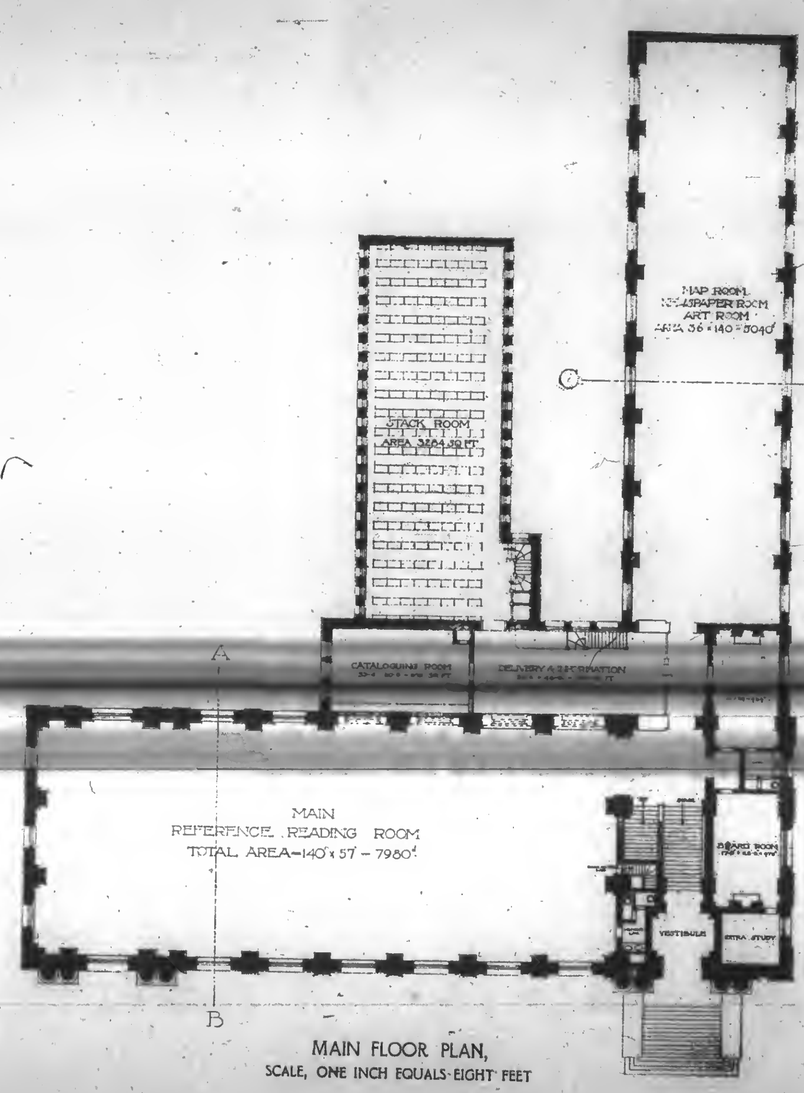
HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices



BASEMENT PLAN,
SCALE, ONE INCH EQUALS EIGHT FEET



MAIN FLOOR PLAN,
SCALE, ONE INCH EQUALS EIGHT FEET

PUBLIC REFERENCE LIBRARY FOR TORONTO.

MESSRS. WICKSON & GREGG AND A. H. CHAPMAN, ASSOCIATED ARCHITECTS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JUNE, 1906.

FRONT ELEVATION ON COLLEGE STREET

ELEVATION ON ST. GEORGE STREET.

PUBLIC REFERENCE LIBRARY FOR TORONTO.

MESSRS. WICKSON & GREGG AND A. H. CHAPMAN, ASSOCIATED ARCHITECTS, TORONTO.

Wickson & Gregg } Associated Architects.
A. H. Chapman }

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JUNE, 1908.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS,
W. A. LANGTON - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—NO. 223. JULY, 1906.

ILLUSTRATIONS ON SHEETS.

Rectory for the Church of the Holy Trinity, Winnipeg—Messrs. Darling, Pearson & Over, Architects, Winnipeg.
Bank of Toronto, Branch on Yonge Street, Toronto.—Mr. E. J. Lennox, Architect, Toronto.
Federal Life Building, Hamilton. Views of Progress in Construction.
Houses of Small Cost for a Country Town.—No. v. Designed by Mr. W. L. Somerville, Toronto.

CONTENTS

Editorial	97-98	New Buildings in Montreal	107
A Talk on Cement—Second Part	99	The P. Q. A. A. Sketching Club	108
Books	100	Trade Schools	109
Illumination	101	Employment of Union Labor	110
Council of Arts and Manufacturers	104	Tenders	ix
Intercommunication	105-106	Publications	xiii
Montreal Notes	107	Alberta Architects	

Mr. Norman Shaw V. Shopkeepers.

Regent street Quadrant is to be rebuilt and the owner who happens to be the Crown has had a design for the whole Quadrant prepared by Mr. Norman Shaw, which design is obligatory upon the lessees. The shopkeepers have raised the objection that the new fronts would be unsuitable "from a trading point of view." The special subject of complaint is the stone columns which carry the front and give the substantial basis Mr. Shaw has aimed at for the upper structure. The objections made by the shopkeepers are: First, that the columns break the continuity of the building line so that a single occupier of several shops could not have the continuous window he thinks necessary; and, secondly, the glass would be set back, (behind the columns), so that a person passing along the street could not look into a window until he was abreast of it. These are the two standard objections to anything but a continuous sheet of glass. There is already evidence on the other side in England; but the Quadrant will be a test case, for Mr. Shaw stands firm on the ground that his design has been approved by the Government. He says further that he has made the windows wider than they were before—17 ft. instead of 14 ft.—so that there is a good deal of room for display. The question is whether the goods in a window would not look better in an architectural frame. It is rather a question of an attractive display than a comprehensive one. Everything cannot be shown in the window. It is a question of a suggestive invitation, and an appearance of reserve always adds to the suggestion. The better class of English shops are already aware of this; "everything in the window" is not a style of business that appeals to the best purchasers. If the Quadrant design is carried out unchanged, and, as is likely, does not change the charac-

ter of the place as a shopping centre, there will be a decided impetus given to the progress of the more architectonic shop-front.

The Toronto Civic Investigation. The County Judge's investigation into the conduct of building operations for the city of Toronto has resulted in a report implicating certain contractors and architects and an alderman in conspiracy to defraud the city. The Mayor at once forwarded a copy of this finding to the County Crown Attorney instructing him to proceed against the persons named in the judgment as being guilty of corruption, and trials are at present in progress.

Much as we may regret the occurrence of such operations, that this inevitable recognition by the law should be prompt and decisive is the best thing that can happen now to prevent the further growth of this evil.

Master Painters in Convention. The Convention of the Master Painters' and Decorators' Association of Canada is being held as we go to press, in Windsor, Ont., on July 24th. Besides a Question Drawer there are seven practical papers announced as follows :—

1. Paper, "The Master Painter as a Business Man," by George Metcalf, of Hamilton.
2. "The Apprenticeship Question," by J. M. Faircloth, Toronto.
3. Paper, "Blistering and Chalking of Paint; Their Causes and Remedy,' by T. McMahon, of Kingston.
4. Paper, "The Master Painter as an Educator of Original Decoration," by H. R. Reynolds, of Guelph.
5. Lead tests by members of Hamilton Association.
6. Paper, "The Paint Shop, Its Plant, Its Cost and How to Care for It," by Robert Simpson, of Sarnia.
7. Paper, "The Local Association, Its Advantages to the Individual Master Painter," by James Phinnemore, Toronto.

We have seen the papers read at a previous Convention. They were good. Two of them were reprinted in this journal. There are other authors this time, and it will be observed that they come, for seven papers, from six different towns. There is no local monopoly of the production. The whole country seems to share the talent—or energy or *espril de corps* —whatever it is. *What it is* is a question which might well form the one and only question in a question-drawer for the Architectural Associations, for whose Conventions, the production of papers is always a difficulty. Architects are busy men and their want of time is genuine. But what about the painters? They are not our leisure class. And time is so adaptable; the time required for what one does not want to do, compared with that required for what one does, is as ten to one. It is evidently a great saver of time to do things with a will. But that conclusion does not help us. It seems only to strengthen the evidence that architects do not prepare papers willingly, and the question is still—why? Yet our lady clients are right; architecture is 'such an interesting profession'. It is also full of difficulties. One would think that every man in it would want to talk to other members of the profession about something and hold them to his subject. Here then is his chance to have the talk all his own way without anyone having the right to call him a bore. He will be much clearer in his ideas for putting them together in a paper and will learn a good deal when he reads it.

Stanford White. The criticisms of Stanford White's work, that have been published, explain the adaptations of old work which were so frequent in the work of McKim, Mead and White. Mr. White was responsible for them. He is said by his friends to have been rather a painter than a architect. This account of him suggests a process of mind that would account for the disappointing character of much of his work which one cannot but nevertheless admire for its beauty. A painter's work however original is based on studies from nature. His virtue consists in truth to nature. His effects must all be found somewhere in nature. He merely points out the beauties of nature to the unobservant. And as the scenery of the world is the painter's study book, so was the world's architecture a study book for Stanford White. The architectural process does not appear to have occupied his mind so much as the results. In other words he had, as is said, a painter's mind, rather than an architect's. A comparative estimate of painters and architects in the scale of merit would be difficult; they are not in the same category when there is a distinction drawn between them. But when the painter carries his painter's mind into the other profession, inferior rank is inevitable. To associate, as has been done, Stanford White with H. H. Richardson, as workmen of the same class, is absurd. It seems true, however, that White has had the greater influence. The influence of Richardson is in fact yet to come. His work is there, and the study of it by those are ripe for it will not produce—has not produced—Richardsonian Romanesque; but it will produce architecture. In the mean time it is very [illegible] that a strong influence in the direction of this ripening has been that of Stanford White. His adaptations of the good things of other lands and generations—copies that have lost nothing from his handling—have done much to improve the taste of his day, and to give credit to scholarship among a people who might easily have turned to excesses of crudeness in the pursuit of another idea. To see the gulph that was between the architecture of New York and the architecture of Italy or Spain leaped over all at once, and beauties both foreign and ancient planted down unchanged and looking very much at home, was, for the public, more than an education, it was an impulse. The American Romanesque and Americanism generally was about then given up in favour of tradition—including their own tradition of the Colonial style, which was also a favourite motive with McKim, Mead and White—and there is no doubt that Stanford White's pictorial exercises with bricks and mortar (and marble) is rightly looked upon as a principal if not *the* principal cause of this diversion of aim, and he may be classed as one of the educators of the nation—an influence in the progress of architecture in America towards that original excellence which he did not aim at himself.

A TALK ON CEMENT.*

SECOND PART—TESTING.

The unpleasant feature in the use of cement is the necessity of testing and the imperfection of the methods of testing. A perfect method, Mr. Gillespie says, has yet to be devised; and a uniform method—or rather a method which with uniform material will give uniform results in the hands of all experienced operators—has also yet to be invented. It is, however, possible for the general user to employ a few simple tests that will sufficiently for his purpose discover a good cement, and expose the pernicious qualites of a bad one. The usual tests are six :—fineness of grinding, specific gravity, tensile strength (neat and with sand), the hot test, and the time of setting.

Fineness of grinding is not a sure indication of the value of a cement, although all cements are improved by grinding. Fine grinding decreases the tensile strength of neat cement, but it increases the strength of mortar; and as cement in practice is always used in combination, fineness of grinding is a first consideration. It is measured by sifting a given quantity through sieves of various sized mesh, usually fifty, one hundred and two hundred to the lineal inch. The residue left on the sieves, expressed as a percentage of the original weight, classifies in the scale of fineness the cement tested.

The specific gravity test is considered to be a means of detecting under-burning, over-burning or adulteration. Specific gravity is the relation borne by the weight of a body to the weight of an equal volume of a certain specific body which is taken as the standard of comparison. That specific body is water. Water—besides the fact that it is always procurable—has two other qualities which fit it for the purpose :—first, a given volume of water always weighs the same at the same temperature; secondly, it is easy to compare other bodies with it, volume for volume, by simply measuring the amount of water they displace when immersed in it. In testing cement [illegible] water acts [illegible] it is necessary to use some other liquid —usually kerosene or turpentine—for the purpose of measuring volume, but, when the volume is ascertained it is still the weight of an equal volume of water to which reference is made as the standard of comparison. The operation is performed with a glass vessel of tube-like shape; there is more than one form, but the essential feature is a scale of volumes, (usually of cubic centimeters), marked on the glass, so that a rise in the liquid within can be accurately measured off. The vessel is then filled with kerosene or turpentine up to the lowest mark on the scale; a weighed quantity of cement powder is introduced, (carefully, to avoid air-bubbles), and the amount the liquid rises on the scale marks the volume of the cement powder. The weight of the cement powder divided by the weight of a volume of water equal to the volume of liquid displaced is the specific gravity of that cement. The test lies in the comparison of this specific gravity with that of good Portland cement. An overburned fused clinker will give a heavy cement while an underburned one is likely to be light. Adulterants being usually of less density than cements, their presence will reduce the specific gravity. In order that the volume of liquid may be invariable during the operation care must be taken to prevent draughts of either hot or cold air. Care must also be taken to prevent reduction of volume by evaporation —either from a too lengthy exposure or from the use of a too volatile liquid.

To make the tensile test the cement is made into a stiff batter and placed in briquette moulds of a least cross-section of one inch. After setting for twenty-four hours in moist air, the briquettes are removed from the moulds and placed in water for varying periods. These periods are usually three days, seven days, twenty-eight days, and three, six or twelve months. At the end of the interval desired they are broken in some kind of testing machine. The point of carrying on the test over these long periods is that over-limed or under-burned cement shows a dropping off in ultimate strength after a time, while the strength of good cement increases with age. A test occupying a year is therefore desirable to establish the character of a brand of cement. For ordinary work a shorter test is made, and the briquettes are usually made of cement and sand in proportion of one to three. The tensile test is used, (though in practice cement is not much subjected to tensile strain), because it is more easily applied, (requiring less force), than a test by compression. The relation of tensile strength to compressive is sufficiently constant, (being from one-seventh to one-tenth), to make it possible from a tensile test to calculate properly for compressive strength. This valuable test unfortunately requires a machine, but it is possible to procure a spring balance testing machine for from 60 to 80 dollars.

The hot test is also a valuable test and can be applied more easily. This is a test for "soundness." It is also called a test for "constancy of volume." If any matter, that is to say, is present which will cause disintegration or unsoundness in a pat of cement, it will operate by altering the constancy of its volume. The usual cause of unsoundness is excess of lime. In the [illegible] of time the cement disintegrates, usually from expansion. But, as one cannot await the course of time for a test, the hot test has been devised as a means of accelerating the operation of disintegrating forces. It consists in exposing the test pats of cement for some time to the action of moist air above a hot bath, (about the temperature of which there is some variety of opinion), and then lowering them into the bath for another period. Mr. Gillespie's bath, for testing Ontario cements, was kept at 120° F. He suspended his pats in the vapour of this bath for six hours and put them into the bath for the remaining eighteen of the twenty four hours. This is a test that might be easily applied by cement users, and for ordinary purposes makes a good test. If after it the cement gives a ringing sound and has not expanded or warped it will do. Otherwise further testing must be procured.

The time of setting is tested at two stages—initial and final—by means of two "needles," as they are called, or fine steel rods weighted with balls attached to the middle of the shaft. One measures one twelfth of an inch in diameter and is weighted with a quarter of a pound; the other measures one twenty fourth of an inch in diameter and is weighted with a pound. The time of initial set is defined as the interval elapsing from the addition of water to the cement until

* Based on a paper on The Cement Industry of Ontario by Mr. P. Gillespie in the Report of The Bureau of Mines of Ontario; Vol. XIV., Part 1.

the pat thus formed will support the larger needle weighted with the lighter weight. The final set is from the addition of water until the pat will support the smaller needle and heavier weight. Support implies a surface unmarked by the needle. A minimum of water should be used; just enough to cause a gloss to appear on the surface of the batter.

The STANDARD SPECIFICATIONS of the CANADIAN SOCIETY OF CIVIL ENGINEERS are as follows:—

The whole of the cement is to be well-burned pure Portland cement, of the best quality, free from free-lime, slag, dust or other foreign material.

(1) *Fineness:* The cement shall be ground so fine that residue on a sieve of 10,000 meshes to the square inch shall not exceed 10 per cent. of the whole by weight, and the whole of the cement shall pass a sieve of 2,500 meshes to the square inch.

(2) *Specific Gravity:* The specific gravity of the cement shall be at least 3.09, and shall not exceed 3.25 for fresh cement; the term "fresh" being understood to apply to such cements as are not more than two months old.

(3) *Tests:* The cement shall be subjected to the following tests:

(a) Blowing Test: Mortar tests of neat cement, thoroughly worked, shall be trowelled upon carefully cleaned 5-inch by 2½-inch ground glass plates. The pats shall be about ½-inch thick in the centre, and worked off to sharp edges at the four sides. They shall be covered with a damp cloth and allowed to remain in the air until set, after which they shall be placed in vapor in a tank, in which the water is heated to a temperature of 130° F. After remaining in the vapor six hours, including the time of setting in air, they shall be immersed in the hot water and allowed to remain there for eighteen hours. After removal from the water the samples shall not be curled up, shall not have fine hair cracks, nor large expansion cracks, nor shall they be distorted. If separated from the glass, the samples shall break with a sharp, crisp ring.

(b) Tensile Test, Neat Cement: Briquettes made of neat cement, mixed with about 20 per cent. of water by weight, after remaining one day in air, in a moist atmosphere, shall be immersed in water, and shall be capable of sustaining a tensile stress of 250 lb. per square inch, after submersion for two days; 400 lb. per square inch after submersion for six days; 500 lb. per square inch after submersion for 27 days. The tensile test shall be considered as the average of the strength of five briquettes, and any cement showing a decrease in tensile strength on or before the twenty-eighth day shall be rejected.

[illegible] The sand for standard [illegible] quartz, crushed so that the whole shall pass through a sieve of 400 meshes per square inch, but shall be retained on a sieve of 900 meshes per square inch. The sand and cement shall be thoroughly mixed dry, and then about 10 per cent. of their weight of water shall be added, when the briquettes are to be formed in suitable moulds. After remaining in a damp chamber for 24 hours, the briquettes shall be immersed in water, and briquettes made in the proportion of one of cement to three of sand by weight, shall bear a tensile stress of 125 lb. per square inch after submersion for six days, and 200 lb. per square inch after submersion for 28 days. Sand and cement briquettes shall not show a decrease in tensile strength at the end of 28 days or subsequently.

(4) The manufacturers shall if required, supply chemical analyses of the cement.

(5) *Packing:* The cement shall be packed either in stout air and water-tight casks, carefully lined with strong brown paper, or in strong air and water-tights bags.

(6) The manufacturer shall give a certificate with each shipment of cement, stating (1) the date of manufacture; (2) the tests and analyses which have been obtained for the cement in queston at the manufacturer's laboratory; (3) that the cement does not contain any adulteration.

If a young man does not aim at a far higher mark than he will reach, he will stop short at a far lower mark than he might reach. The higher the idea the higher the achievement. Men do not accomplish everything which they believe they can do, but they certainly do nothing unless they believe they can do it.

BOOKS.

ARCHITECTURAL HARDWOOD FINISHING. A PRACTICAL TREATISE ON MODERN METHODS OF FINISHING THE WOODWORK OF NEW BUILDINGS. BY GEORGE WHIGELT. THE PAINTERS MAGAZINE, 100 WILLIAM STREET, NEW YORK. $1.00. The fifteen articles of which this book is made up were originally published in THE PAINTERS MAGAZINE. The author is a practical mechanic who writes from experience and describes the working processes for preparing the woods and obtaining the different finishes.

BRAYTON STANDARDS. A POCKET COMPANION FOR THE UNIFORM DESIGN OF REINFORCED CONCRETE BY LOUIS F. BRAYTON, CONSULTING ENGINEER, MINNEAPOLIS. $3.00. The strength of the various members in a reinforced concrete structure can now be as safely calculated as in a structure of wood or stone. The design is usually left to the contractor with the result that there is no equality of conditions for competitive tendering, nor the same freedom in the choice of method of construction. BRAYTON'S STANDARDS aims at furnishing for designers of reinforced concrete the same kind of information that is supplied by the Carnegie Handbook for designers in structural steel. Enough of the theory of reinforced concrete is given to satisfy those familiar with the subject that the principles involved are correct; further than this it omits the theory and gives only the information desired by designers.

THE ESTIMATOR'S PRICE BOOK AND POCKET COMPANION. BY I. P. HICKS. DAVID WILLIAMS COMPANY, 14-16 PARK PLACE, NEW YORK. $1.00. The prices given are average American prices which, (much lower than the inflated prices of Toronto), seem to compare very well with average prices elsewhere in this province. The book is prepared for corrections and additions to the price lists, by blank pages columned and headed for dimensions and prices; the intention being that builders should make it their pocket companion and guide. For this purpose there are some tables of general information necessary for [illegible] the calculations upon which an estimate is based.

CLASS ILLUSTRATIONS FOR THE STUDY OF ARCHITECTURAL HISTORY, BY BANISTER F. FLETCHER, F.R.I.B.A. B. T. BATSFORD, 94 HIGH HOLBORN, LONDON. The case, we have received, of reprints in sheet form of the well known illustrations of Mr. Banister F. Fletcher's History of Architecture, is of the small size, the same as in the History. The subject matter is divided into four sections: 1 Classic styles, 90 plates; 2 Mediæval styles, 102 plates; 3 Renaissance and Modern styles, 75 plates; 4 Non-Historical Architecture, 36 plates. In this size each of the first three sets costs four shillings, and the fourth one shilling and sixpence. These drawings—or a comprehensive set of 168 of them—are also reproduced on a large scale, measuring 40 inches by 27 inches, (the size of the original drawings), and are printed on double elephant paper for use as wall diagrams for lectures. From the method, employed by the author, of grouping illustrations together on a page, the 168 sheets contain some 2,000 illustrations. The price of a set is £60 unmounted, £70 mounted on paper, and £80 mounted on paper with a green silk edging. A series of not less than ten diagrams may be purchased, in any of the above styles of finish, for 8s, 9s or 10s, each drawing, according to the finish.

OUR ILLUSTRATIONS.

BANK OF TORONTO; BRANCH ON YONGE STREET, TORONTO. MR. E. J. LENNOX, ARCHITECT, TORONTO.

The corner of Queen and Yonge streets, which was not long ago above the business belt of Toronto has now, since the establishment of the City Hall in that neighbourhood and the growth of the departmental stores which have clustered there, become a conspicuous business centre. This is the second branch bank, with a substanial character of design, that has been built near that corner during the last year.

The building shown in our illustration has now reached the pediment. It is constructed of cut stone throughout: of the light colour, (Indiana limestone), which alone seems appropiate to a classic design.

As we shall doubtless publish a photographic view, later on, it will be interesting to our readers to have this elevation with which to compare the perspective effect, showing the dome in retreat and the facade terminating with the acroteria of the attic.

The proportion of parts, measurable upon the elevation, will be found to exceed somewhat the classical proportion in weight.

RECTORY OF THE CHURCH OF THE HOLY TRINITY, WINNIPEG. MESSRS. DARLING, PEARSON AND OVER, ARCHITECTS, WINNIPEG.

The obvious excellence of this house requires no comment. It is a good example of an exterior arising from the plan, and producing a true architectural effect by material and arrangement only. It should be observed that material is not stinted in the chimney, and much of the effect is due to its mass—rising full size to the top. The success of this chimney does not however constitute a recipe for chimney design. It suits the particular case of the square-edged, square-topped fire-place bay. If we are to extract a moral from it, the moral might be that the success of simplicity lies in the perception of character in a design and a feeling for harmony with it, in all details.

[illegible]

FINLEY AND SPENCE, ARCHITECTS, MONTREAL.

We have already published, in our number for May, the architects' perspective drawing of this building.

Our present illustrations, from the photographic records of the Canadian White Company who are doing the work, show the progress of about two months; from the completion of the steel frame to the completion—or near completion—of the exterior casing, accompanied, of course, by interior work of different kinds.

HOUSES OF SMALL COST FOR A COUNTRY TOWN—NO. IV DESIGN BY MR. W. L. SOMERVILLE, TORONTO.

The point of doubtful applicability in this design is the style. It has not a native look, and would not be well carried out by native workmen proceeding according to their usual methods. But the plan is in the main good—decidedly good. The point in which it would be the better for change—the excess of openings—is precisely that which will disturb the exterior effect as now designed. So we may treat the plan and leave the elevation to come out altered accordingly. It would be well, however, to make this one definite effort at its composition—that the front and back gables be brought down to a position of subordination below the main ridge. The simplest way to do this is to raise the ridge. The bedrooms would thus acquire another foot or so of head-room for which they would be the better, and the additional cost would be small. But the alcove window might also be reduced both in height and width, and this gable would come down in height accordingly.

In other respects the windows of the upper floor are satisfactorily planned both for outside effect and inside comfort. That each bedroom has two windows, with different aspects, is an excellent thing for air in winter as well as in summer.

On the ground floor, however, just half the number of sashes would be about right. We can drop them out and raise our roof out of the saving.

Two sashes on the east wall of the living-room and one on the south would be more comfortable to live with, and would give some much needed wall space to that room—for which end the door to the kitchen might be closed up too. One sash on the south wall and the glass door is all the dining room needs. The hall and staircase, (a very nice arrangement), have evidently an open-work screen between and do not need such copious light on each side of it. The effect would probably be most interesting with most light on the staircase side, and this might come from a good sized window on the landing over the kitchen entry. A small hall window also, chiefly to fulfil a decorative function, would be necessary.

All these alterations would work well in elevation and the result would be a very good house to fit our problem.

ILLUMINATION OF A RESIDENCE.

BY ERNEST C. WHITE, M. E.

The application of scientific or engineering principles to house lighting, when practiced at all, is commonly confined to the selection of more or less efficient light sources and accessories after their location has been permanently determined. The locating of outlets by the rules of [illegible] ridicule as a means towards efficient illumination of the home. In many causes this locating is left to some more or less experienced, but irresponsible workman

The design selected for description is that of illumination by electric light of a residence 54 x 63 ft., three stories and basement, and costing about $30,000. It may be said in passing that the same principles have been applied to the design of lighting for many houses costing only $5,000 with equal economy and effect Limitations of space will not permit the publication of the complete lay-out and schedule, so it will be best to select the illumination for a small section of the first floor for more complete analysis and description, and to indicate in general the equipment for the balance of the house together with the reasons for its adoption.

Fig. 1. is a corner of the first floor plan showing the reception and dining room, each of which is entered from a large main hall in the center of the house. An extract from the schedule including the items pertaining to the lights shown in this plan, is given below. Some of the sketches referred to in the schedule are reproduced in Fig. 2. The purpose of these sketches is to indicate the essential dimensions and general character of fixtures, as well as the directions in which the sockets should point to give the best results. They

*Engineering of Illumination, Aikins Building, Winnipeg.

serve as an indispensable aid to the owner in selecting the fixtures and as a guide to the workman installing them. In many cases the sketches show graphically the exact location of lights over billiard tables, near mirrors, etc.

RECEPTION ROOM.—This is in very light finish and

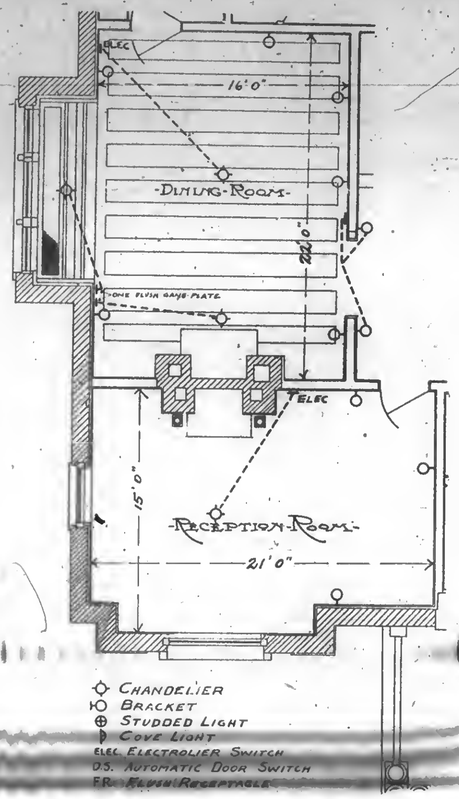


FIG. 1.

the lighting required is, for ordinary purposes, a mild general illumination and, some occasions, an effect of considerable and well-diffused brilliancy. It is of no little importance that the light shall be of a mellow tone, for the ladies cannot be left out of the problem and the appearance of the complexion is remarkably dependent upon the color of light by which it is viewed.

The owner's preference in this case was for a crystal chandelier of some sort. This can be very well adapted to the purpose in hand, though there is perhaps no other form of fixture so easily misused. Sketch No. 12 shows the general form of chandelier required. The balance of the equipment is indicated in the schedule opposite "reception room center" and in accompanying instructions. Four of thelights point towards the corners of the room and the fifth straight down. Each of these lights is provided with a certain form of prismatic glass reflector having a very translucent yellow enamel coating. These reflectors concentrate the light on the crystals in the direction where the illumination is most needed and also produce the color required, the actual illuminating effect being about the

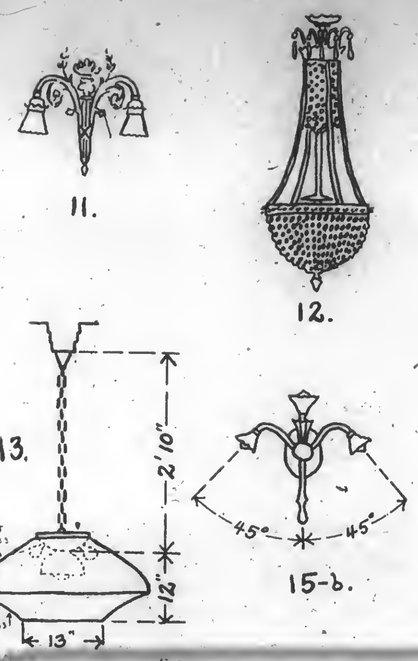


FIG. 2.

same as from a sufficient number of paraffin candles, with excellent diffusion. An electrolier switch provides means for turning on only one, four, or all of these lights as required.

For purposes of symmetry and also to avoid dark ends of the room, this chandelier is centered between the fireplace and window. three 2-light brackets are then provided to illuminate the other end of the room, two being near the entrance and the third placed to come within the vista from the center of the main hall. This gives six sources and enables the use of small candle power provided with close fitting prismatic reflectors, having a canary yellow coating, thus maintaining a uniform color and altogether avoiding any vision of high intrinsic brilliance at any point. The

LOCATION	No. of Fixt.	Lights per Fixt.	Ht. of Outlet	Ht. of Socket	Style Socket	Control	Sketch No.	Diam Holder	Reflectors	Lamps No.	Lamps C.P.	Remarks
Reception Room Center	1	5	Ceiling	8' 0"	Bent. 15 KY	Electrolier	12	B#246	IE-50-24	5	32	Frosted (±)
" " Side	3	2	6' 0"	—	Pull	Short Chains	11	1½"	IE-28C-24	6	4	Frosted candelabra style A.
Dining Room Center	1	5	Beam	7' 1"	Bent. 15 KY	Electrolier	13	SPCL	P-7330	1/4	32/4	One reflector only.
" " Brackts	6	3	6' 3"	—	Pull	Short Chains	15	1½"	IE-28C-2p	18	8	Frosted candelabra style A.
" " Window	1	1	Ceiling	6' 6"	Keyless	Rotary Flush	14	1½"	IE-62-2p	1	16	Frosted
" " Fire Pl.	1	1	Beam	8' 0"	Keyless	" "	Lantern	—	——	1	8	

sockets point straight down as indicated in sketch No. 11.

DINING ROOM.—This room requires a great deal of light. The walls very dark with 7 ft. panelling in mahogany, and the reflecting value of the ceiling is greatly lessened by the many beams. In fact the average coefficient of reflection cannot be assumed above 10. thus making the ratio between total and direct illumination 1:11. This applies only, however, to the general illumination, and is somewhat increased by the brillantly lighted table which has a high diffuse reflection.

The position of the table being fixed by the location of the central fixture, this is moved slightly off center towards the service and away from the fireplace and entrance. Sketch No. 13 indicates the fixture to be used and is intended to illuminate the table very brightly, avoiding any direct light in the eyes of the diner except that which is not absorbed by the art glass shade, and at the same time keeping the fixture well above the tables. The reflector used on the 32-c. p. lamp in this position gives 3 candle feet illumination at the center of the table falling off to 2 candle feet near the edge or where the light is cut off by the enclosing shade. The four 4-c. p. lamps, arranged to be turned on subsequently or alone by the electrolier switch, are for the purpose of producing brighter illumination of the art glass when desired. It may seem to the reader that both of these purposes could have been served as well by using lamp with no reflector in the shade. In fact, however, it would require a 100 c.p. lamp to produce the same illumination on the table allowing a generous reflection from the inside of the art glass, and the result would then be less effective due to the higher relative brilliancy of the visible shade.

For the general illumination of the room it was decided to use brackets located in the upper panels of the wainscot. The number and location of these is indicated in the plan and the direction of sockets in sketch No. 15. As it is necessary to use 8-c.p. lamps to produce the illumination that would be required on some occasions, the lamps are further shaded by pink enamel coated prismatic reflectors of the form giving a good distribution as located and avoiding to a degee the useless spots of light on the panelling. The pink tint serves to accentuate the illumination of the wainscot and to prevent undue contrast. The effect is not only more agreeable, but less trying on the eyes.

A pendant light in the window equipped to thoroughly illuminate the bay, and an ornamental lantern swung from a beam opposite the breast of the chimney, complete the installation for this room.

It will be observed that while every provision has been made for supplying requisite illumination in these rooms, there is no light source of high intrinsic brilliancy placed where it can ordinarily be within the direct range of vision. It is for this reason that the illumination is visually efficient, in addition to the increased economy obtained by directing the rays where needed; in other words, the lighting is *comfortable*. The illumination in a light finished room is easily doubled by diffuse reflection. Yet with the proper accessories the illumination from the same scource may be as easily multiplied four or five times in the plane where it is of use.

But not many rooms require to be treated as problems in illumination to the same extent as those just described. It is true that the human eye has been educated by day light conditions, and yet it is by no means essential to attempt to simulate these conditions in either distribution or color if the teachings of actual physiological experiment are observed. It is well, therefore, to consider for every room whether a ground work of fairly uniform illumination is necessary, for in many cases it is not. The following outline of equipment for the more important rooms contains illustrations.

Basement, 8 ft. 9 in. to ceiling

Laundry 15 ft. x 22 ft. One 34-c.p. at ceiling with 12 in. opal reflector. one 16-c.p. drop, over near edge of tubs with, 10 in. opal reflector. One 8-c.p. with 6 in. opal reflector on bracket over sink.

Drying room 21 ft. x 13 ft. Two 32-c.p. lamps with 24 in. opal reflectors at ceiling.

Furnace room. 18 ft. x 28 ft. One 32-c.P. near ceiling in front of furnaces with opal reflector, two 16-c.p. similarly located opposite fuel room.

Man's room. 14 ft. x 15 ft. One 16-c.p. and one 8-c.p. on brackets near dresser and table with reflectors which produce a ⅛ candle foot illumination in the furthermost parts of the room.

Billiard room. 30 ft. x 15 ft. with two bays. The table is located at one end and is lighted by only two 16-c.p. lamps arranged with reflectors concentrating nearly all of the light evenly over the bed of the table. These lights are also provided with special opalescent shades cutting off direct rays beyond the edge of the table. They are also made to allow sufficient light through the top to illuminate the string and the ceiling.

At the other end opposite the fireplace is a drop fixture with a shaded 32-c.p. lamp and reflector, carried on a wireless cluster with four 4 c.p. frosted lamp outside of the shade and controlled by an electrolier switch.

Lavatories both here and on the main floor 7 ft. x 8 ft. and 8 ft x 10 ft. one 8-c.p. and one-10 c.p. respectively on brackets over wash basins.

Stairways. Two of these are each [illegible] c.p. lamp studded in the ceiling over the *bottom* of the stairs with a concentrating reflector giving an average of about 1/3 candle foot on the steps without shadows. A third stairway is properly lighted by the lamp opposite one of the fuel rooms.

First floor. 10 ft. 3 in. to ceiling.

Front porch, 11 ft. x 12 ft. Hanging porch lantern with concealed reflector as near over steps as convenient and designed to effectively light the steps, porch and house number with one 16-c.p.

Verandah 46 ft. x 11 ft. Two 16-c.p. lamp hung 8 ft. above floor with reflectors giving broad downward distribution over whole verandah and fair reading intensity under each light under the ordinary conditions of dark surrounding.

Vestibule, 7 ft. x 7 ft. Cove lighting. Arranged to turn on four 8-c.p., four 16-c.p., or both. The lights are provided with aluminum reflectors concentrating most of the light evenly over the arched ceiling. This is a beautiful though expensive method of lighting and in this cause is only used to produce a comfortable transition from comparative darkness to the well-lighted interior.

Alcove. 7 ft. x 7 ft. next to vestibule. One 16 c.p. pendant in a prismatic reflector with frosted bowl beneath. This is a very useful combination.

Main hall. 18 ft. x 22 ft with open stairway in

center. This was treated as a center of travel in four directions. On either side of the entrance alcove is a bracket supporting two 16-c.p. lamps upright with refracting globes. The columns at the foot of the stairs carry a pair of brackets each supporting an upright 50 c.p. lamp in a 10 in. refracting globe. These are so located as to leave no dark corners in the hall and provide excellent illumination as far as the landing. At the opposite entrances to living and dining room are four brackets each supporting three 4-c.p. frosted bulbs upright. Two of these brackets appear in Fig. 1. The whole arrangement is designed to make convenient and agreeable the ordinary coming and going, receiving and Godspeeding, that make such a hall a center of every day interest and importance. Incidentally some pleasing vistas are produced.

Living room. 30 ft. x 16 ft. with large cased opening; treated practically as two rooms. Opposite entrance is a chandelier supporting five 16-c.p. frosted lamps in ornemental cut prismatic reflectors. One of these lights is pendant, producing good reading intensity near the center of the room. On both sides of the bay and cased opening are four ornamental brackets each carrying one 10-c.p. frosted lamp with a coated prismatic reflector. These provide comfortably distributed centres for reading or games. At the other end of the room are two corner brackets each supporting three 16-c.p. frosted lamps with coated reflectors, so located as to direct the illumination from a comfortable angle. A flush receptacle for a table lamp is also provided.

Study 15 ft. x 16 ft. This is really more of a den. Four pendant switches with 4 in. spherical 32 c. p. frosted lamps in prismatic reflectors, having a green tinted enamel coating, are used to provide a reading intensity and quality in the four corners of the room, at the same time lighting up the face of the book cases and pictures with partially corrected light giving almost day-light color values.

Breakfast Room 10 ft. x 16 ft. A short chandelier carrying four pendant 10-c.p. lamps controlled by electrolier switch. One pair is equipped with concentrating reflectors and the other two with a distributing form, all being coated and partly tinted in green.

Kitchen 16 ft. x 16 ft. One 32-c.p. partly frosted pendant 8 ft. above floor, with reflector giving strong and even illumination over entire room without eye strain, an important need in this place and one usually neglected. Over the sink is a small bracket with upright 8-c.p. frosted lamp. Unshaded it lights the adjacent shelves, from which a reflector is conveniently taken and set over the tip without holder to produce a concentrated illumination for dish washing.

Side and Rear Entrances, etc., are usually lighted with an 8-c.p. lamp placed high up with small concentrating reflectors giving a leading intensity in at least one spot and leaving an unobstructed passage way.

SECOND AND THIRD FLOORS.

Main Hall 18 ft. x 24 ft. In the center of this hall and over the open stairway is a wireless clustre pendant 6 ft. 6 in. above the second floor level. The center light is controlled by two 3-way switches independent of the rest which are used when general illumination of the upper hall and landing is required.

Bedrooms. The bedrooms average about 16 ft. x 16 ft. and are in most cases equipped with two bracketed 16 c.p. frosted dresser lights having pink tinted and coated reflectors. 4-c.p. lamps are studded in ceiling of all closets with small concentrating reflectors and automatic door switches. In general, bedroom lighting should be local. If a bedroom is to have but one light, put it at one side of the dresser. If two lights, put one on each side. If three, the above arrangement is most useful. A third light over the dressing table is also useful for hair-dressing but not necessary.

Baths. There are four baths 10 ft. x 10 ft. Each has a pair of 8-c.p. frosted lamps with close fitting prismatic reflectors placed to direct the light on the face for shaving. There is a comfortable difference between this arrangement and the strong reflection from the mirror itself when no reflectors are used. It is of interest to note that of the 175 lamps used there are 2 50-c.p., 19 32-c.p., 62 16-c.p., 23 10-c.p., 35 8-c.p., and 34 4-c.p.

It is necessary that these lamps shall be made for the actual voltage at the outlets in order to prevent considerable waste, and this voltage should be tested as soon as the service connection is made. Many of these lamps are frosted and some are "reflector frosted" i.e. the tip half of the bulb is frosted.

The installation lacks interest in one particular, namely, that no gas outlets are provided. With the arrival of well designed fixtures for inverted gas burners, such an emergency service can be installed in a manner to satisfy any taste, and if equipped with the necessary color correcting globes these lights can also be used in conjunction with electric incandescent lamps.

COUNCIL OF ARTS AND MANUFACTURES.

At the close of the courses in the industrial and liberal arts, at the Monument National Montreal, on the 13th June, the Council of Arts and Manufactures made the following awards.

ARCHITECTURAL DRAWING.

Fourth year—1st prize, Clovis Brodeur; 2nd prize, Arthur Doucet.

Third year—1st prize, Elie Nadeau; 2nd prize, A Depatie. Honorable mention, E. Viger.

Second year—1st prize, Chs. Sheffler; 2nd prize, E Belleisle. Honorable mention, E. Harvey.

First year—1st prize, F. L. Racette; 2nd prize, A Parnell. Honorable mention, J. S. Gregoire, A. Mathieu, Nathan Mendellsohn, J. C. Ewing, W. A. King.

PLUMBING.

1st. prize, G. Belisle: 2nd prize, H. Montpetit; 3rd prize, Joseph Dugal. Honorable mention, G. Marcus, N. Lacroix.

CARPENTRY.

Beyond competition—Edouard Cusson. 1st prize, Alphonse Langlois; 2nd prize Edgar Charbonneau. Honorable mention, Frs. Lapierre, Art. Lamarre, Ovila Duchesne, Theodule Fortier, Jos. Jobin, F. Bleau, Alph. Dubuc, R. Roberts, Adec Gauthier, G. F. Hobart.

STAIR BUILDING CONSTRUCTION.

1st prize, Prospect Corbeil; 2nd prize, Louis Langlois. Honorable meution, A. Delisle, F. Viger.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Painter":— In several instances where I have fastened porcelain letters on plate-glass windows, letters have fallen off, although I have used cement as recommended by several books and painters. Can you advise me why this separation takes place, and how to overcome the trouble?

Ans.—The constant separation of porcelain and metallic letters from glass is one of the chief objections to this style of advertising. It is caused mainly by the varying rate of expansion between the letters and the glass. This can be overcome by the use of a cement which possesses a slight degree of elasticity, and yet has strong adhesive powers. Such a cement

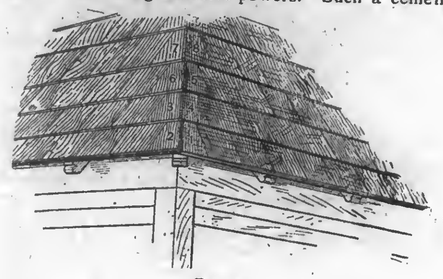


Fig. 1

can be made as follows—Slake 15 parts of quicklime in 20 parts of water; melt 50 parts of caoutchouc and 50 parts of linseed oil varnish together, and bring the mixture to a boil. While still boiling pour the liquid on the slaked lime, little by little, with constant stirring. Filter the mixture through a piece of muslin to get rid of lumps and let cool. This cement takes a couple of days to dry, but makes a very tight and strong joint. By diluting this cement with oil of turpentine a brilliant elastic varnish is obtained that will stick to any surface.

From "Subscriber".—Will you kindly inform me how holes are drilled through plate glass and oblige?

Ans.—Take a small three-cornered saw-file and break off an inch of the end. Then grind a blunt, triangular

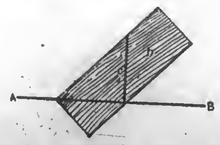


Fig. 2.

point on it, being careful not to hurt the temper. Leave file in the handle and bore just as you would with an awl. The point of the file should not be longer than the file is thick. Use turpentine as a lubricant and keep the cutting edges on points of the file sharp with an oil stone. In boring a plate, it is best to bore from both sides, using very light pressure toward the last, always laying the plate solid on a paper-bound book.

From "British Columbia":—As you must be aware, we use in this glorious Province a vast amout of shingles for roof covering, and I would consider it a great favor—and I am sure other "British Columbians" would also —if you would give me a few pointers as to the most effective ways of shingling hips and valleys, and some patters for ornamental shingles and the names of same.

Ans:—The questions of hip and valley shingling has been discussed in this department on several previous occasions, but the subject has not yet, by any means, been exhausted nor can it be. The following illustrations and descriptive matter will, we think, pretty

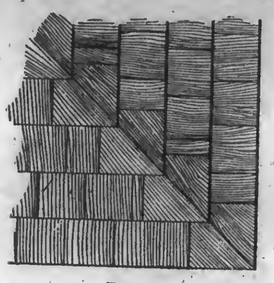


Fig. 3.

nearly meet the wants of our "British Columbian".

First Method—By inspection of the sketch Fig. 1, it will be seen that the triangular shingles forming the joint are cut in such manner that their grain runs parallel with the hip. In laying the roof carry the hip-courses up a little in advance of the other courses. Keep them about two courses ahead of the main work. Place shingle No. 1 with the edge to the hip, and to obtain its shape line across it at right angles to the eaves for the side, and parallel to the eaves for the bottom. After placing and nailing this shingle its edge must be dressed down to correspond to the face of the other side of the roof. Then No. 2 and after it

Fig. 4

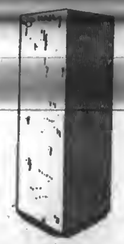


Fig. 5.

No. 3 are laid and dressed down in like manner, then 4 and 5 are laid over them and dressed dawn, continuing in this way, tunning two courses on a side at a time.

By carrying the courses up this way in pairs, it gives the shingles of the hip the appearance of each course being lapped over another, while if laid singly in this general manner, the appearance would be as though the shingles had all been laid up on side, and then those of the other lapped over upon them.

The advantage of the arrangement, I think, will be quite apparent to all practical men who will inspect the sketches. It will be seen by this alternating the courses in pairs the join ton the hip is made very complete, so far as shedding water is concerned, and that those portions of the shingles most likely to curl up when laid in the ordinary manner are thoroughly fastened. Further,

since the grain of the shingle runs parallel to the hip, the tendency to curl is taken away from the line of the hip to a point in the other side of the shingle, where it can do no harm. . .

Second method—Take a shingle and place it parallel with the hip, as indicated in Fig. 2. I then draw a line on the butt of the shingle parallel with the base of the roof A B after which draw the line C plumb with the roof. This gives the pattern ready for cutting. Commence on the hip and shingle back, then trim the points of the next shingles from the one sawed out and carry up both sides of the hip at once. The result will give joints broken twice before the corner or hip shingle goes on. I consider this the best and cheapest plan, for it is necessary to cut but one hip shingle, while the point of the shingle b can be used for the valley, if there is one on the roof. Fig. 3 of the sketches represents the hip after it has been shingled.

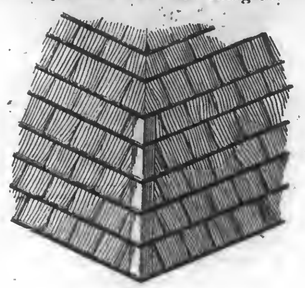


FIG. 6.

Third method : This is a novel way but good. Take strips of tin about 3 x 10 inches. Make a form out of a piece of 2 x 4, 12 inches long, and bevel one side until it forms the hip it is desired to shingle. Then cut an end to the angle of the butts, cutting out the underside at this end, leaving the thickness of the butts. Then place the tin shingle on the form even at the end and bend over the hip. Bend down and under the corners and the tin is ready for the hip. Fasten the shingles by forcing the points marked a b of Fig 4 under the butts of the shingles, and with nails at the top end as indicated in Fig. 5. There is a considerable saving of material by this method, because the waste from cutting the valley shingles may be employed in shingling the hip. The appearance of the hip after the shingling is completed is indicated in Fig. 6 of the cuts.

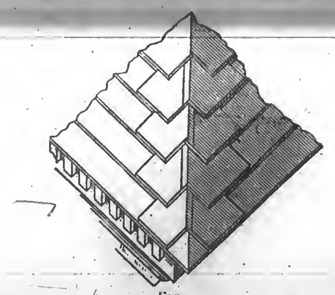


FIG. 7.

Fourth method:—At Fig. 7, is shown a method of shingling a hip that was patented in 1863. "The improvement consists in dropping the corner shingle down over its fellow course, thereby having the full strength of the shingle, and leaving the corner not liato warp or split off. The corner shingles should be of nniform width and about the same number of inches that shingles are laid to the weather. The corner of the first course should be covered with tin. For this purpose take a large sheet and quarter it for the four corners ; commence the double shingling or dropping back with the second course. Every corner shingle should be nailed with a sixpenny nail near the edge of the shingle and midway of the course, as well as with the necessary shingle nails. Overlap alternately the corner of the other side of the hip to keep the corner straight and tight ; all as will be clearly seen by the accompanying cut."

It is claimed for this process that ; The angular piece which finished the course on the edge of the hip is brought down one course below, so as to make an additional thickness at that point and afford means for a more secure attachment.

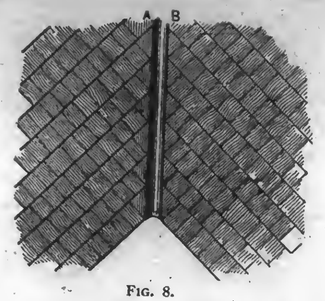


FIG. 8.

"Claim—Subsituting for the ordinary small triangular pieces that complete the courses at the hip, the joints shingles B C D each projecting to the base line of the course already laid, arranged so as to be securely laid and held in place without splitting or warping, and without the necessity of weather-boards and furnishing an extra thickness of covering, substantially as herein set forth." The illustration shown at Fig. 8 exhibits the way a valley should be shingled. Always use a continuous gutter of galvanized iron, zinc or tin, running under the shingles 8 or 10 inches at each side with soldered joints. Cut the shingles so that th- grain of the wood runs in the same direction as the valley and abutting against the straight shingles laid next to the valley as shown on the side marked A and B of the

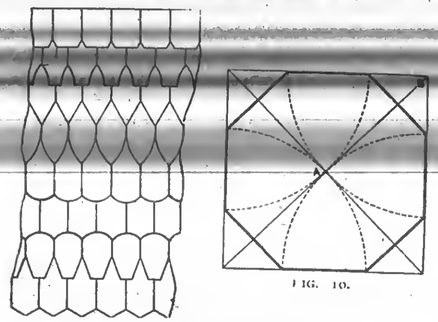


FIG. 9.

FIG. 10.

accompanying sketch. Fig 9 shows eight patterns of cut or ornamental shingles, and which are named in order of their reading, commencing with the top course, Dominion cut, concaved cut, diamond cut, spade cut, round end cut, concave hexagon cut, long Dominion cut, hexagon cut.

From "young workman"—please show a quick method of setting out an octagon.

ANS.—There are various ways of laying out an octagon, but the method shows at Fig. 10 seems to be about as easy as any and is correct. Suppose for example, the diameter is 3 ft. First get the square, then the distance from A to B from each corner and mark across. The sketch Fig. 10 so clearly indicates the method that further explanation would appear to be unnecessary.

MONTREAL NOTES.

One of the first ideas of the Committee on Civic Improvement was to throw out the suggestion that new and wide diagonal streets should be opened up connecting the down town and up town sections of the city by roads of easy gradient. The proposal was to start two such streets at Victoria Square, the one leading to the right and the other to the left. During some recent discussion on the applications by the Street Railway Company to have more widening of streets carried out in order to facilitate car service it was also proposed, with the same end in view, to run a diagonal street from the corner of Craig Street and St. Urban Street, extending to the corner of Sherbrooke Street and Amherst Street. This, of course, forms an alternative to the proposal of the Civic Improvement Committee. The object in view is virtually the same, and the question is whether such a diagonal thoroughfare would be better in this locality than in the other. It may be pointed out that to bring merchandise down town by a road entering Craig Street at the St. Urban Street corner would bring it directly in face of Place d'Armes Hill, a most difficult street for heavy teams or vehicles of any description to negotiate—unless indeed a street car. This objection does not lie against streets arriving in Victoria Square, from which traffic can flow by way of McGill Street to the streets nearer the river, and to the wharves themselves, with little or no trouble as regards gradient. This seems to be a very material point in favour of the Committee's suggestion. If in any of these schemes the Corporation can find a pot of gold nothing would be more welcome, for at present the demand for better street pavings becomes more urgent from day to day, and the only response seems to be that the city coffers cannot meet the demand, and its borrowing powers are strained beyond moderate limits.

At present excavations are the order of the day.

During the month of June permits for new buildings to the estimated value of $2,343,579 were granted, and, as a consequence, yawning chasms are to be seen in all directions. One of these, in particular, has been attracting a good deal of attention. This is the excavation at the corner of Craig Street and St. Urban Street, where the new building of the Montreal Light, Heat & Power Company is to be built. The attraction here is the patent digger which announces itself as the J. W. Harris excavator. This is in the form of a crane operated by steam which, instead of carrying the usual wooden box on the end of a chain, works a vertical steel beam about 30 feet long, terminating in a grasping bucket, which opens in sharp pointed quarters, and is plunged down upon the soil, of which, in closing, it takes a large bite, which is quickly swung up and round and dropped into a cart for removal. Two of these bites fills a cart, and, when work is in full swing, carts are filled at the rate of rather more than one per minute. The soft filled-in-soil at this particular excavation would seem specially favorable to the working of this appliance.

Sunday, the 24th of June, being the fête day of St. John Baptist—patron saint of the French-Canadians—was made the occasion of the unveiling of the monument erected in honour of the French-Canadian poet Octave Cremazie, who died in 1879. The monument is happily placed among the trees in St. Louis Square. Some large granite steps form a base for an upright stone on which is placed a bronze bust of the poet. Upon the stones of the base is placed a bronze figure of a man in an expiring attitude, holding in his arms a flag. Below are inscribed the words, quoted from one of Cremazie's songs, "Pour mon drapeau je viens ici mourir." Mr. Hebert is the sculptor who has executed the work. Though of small dimensions this monument is a charming piece of work, and is a more than creditable addition to the monuments of the city.

Of new buildings recently announced as in contemplation, one of the most important is the office building for the Grand Trunk Railway System, opposite their present general offices on McGill Street. It is proposed to spend about $250,000 on this building, which is to be ten storeys in height, "constructed," it is said "so that if the by-law of the City of Montreal, limiting the height of buildings, is altered at any time, additional storeys can be added." Thus cheerfully does the commercial speculator look forward to the time when by-laws—fondly believed by the humbler citizen to be salutory—shall be improved away. Enthusiasm for this kind of largeness of enterprise has carried many cities a long way up in the air ; but the man in the street must pay for these things in a congested outlook and deteriorated health.

NEW BUILDINGS IN MONTREAL.

At the present time when the estimated value of buildings for which permits are being granted is surpassing all records the following particulars of some of the more important items on the list may be interesting.

Additions to Windsor Hotel, Dominion square; 110 feet 6 in. wide in front, 67 feet at the back, 244 feet deep, nine stories. Estimated cost $500,000. Architects, Hutchison & Wood. Contractors, Peter Lyall & Sons.

Offices of the Royal Bank of Canada, 143-149 St. James street; 60 feet x 100 feet, four stories high with marble front. Probable cost $300,000. Architect,

H. C. Stone. Contractor, Chas. Thackeray & Co.

Offices of the Montreal Light, Heat & Power Co., corner of Craig street and St. Urban street; 95 feet x 100 feet, seven stories, faced with Indiana limestone. Probable cost $200,000. Contractors, John Quinlan & Co.

Factory buildings for the American Tobacco Co., in St. Anthony street between Bourget and Anne streets; buildings varying from one to six stories in height in réinforced concrete. Probable cost $110,000. Architects, R. Findlay & McGregor. Contractors, Dominion Construction and Engineering Co.

Store for Mark Fisher Sons & Co., corner of Craig street and Victoria Square; 76 feet x 83 feet, ten stories. Probable cost $100,000. Architect, Alph. Piché. Contractors, Simpson & Peel.

Dominion Textile Co.'s Factory, St. Ambrose street, St. Henri; 90 feet x 112 feet, seven stories. Probable cost $50,000. Architect, David R. Brown. Contractors, The Hussey Construction Co.

The Smart Bag Co.'s Factory in Mullins street, near Dargenson street; 125 feet in front, 147 feet in rear, 75 feet deep, three stories in brick. Probable cost $50,000. Architect, H. C. Stone. Contractors, Shearer Brown & Wills.

Power House for the Montreal Street Railway Co., in Notre Dame street, near Raymond street; 295 feet x 170 feet, one storey, in brick. Probable cost $95,000. Architects, Marchand & Haskell. Contractors, the Canadian White Co., Limited.

Messrs. Munderloh & Co.'s Warehouse, Jurors street, corner of Victoria square; 56 feet in front, 33 in rear by 122 feet, four stories. Probable cost $60,000. Architects, Hutchison & Wood. Contractors, Barbeau & Dufort.

Store for Glickman & Glickman, St. Lawrence street. Probable cost $25,000. Architect, Jas. Smith. Contractors, Jos. Jacob & Co.

Auction Rooms for M. Hicks & Co., Metcalfe street, near St. Catherine street, four stories. Probable cost $20,000. Architect, J. A. Karch. Contractors, Labelle & Leggard.

Skating Rink in Guy street; 318 feet front, 332½ rear by 162 feet, four stories. Probable cost $15,000.

Factory for the Northern Electric & Manufacturing Co., Grey street, near Notre Dame street; 122 feet by 45 feet, in two stories. Architect, W. J. Carmichael. Contractors, Shearer, Brown & Wills.

Howe, McIntyre & Co., warehouse in Youville square; 58 feet x 63 feet, four stories. Probable cost $10,000. Architects, Macvicar & Heriot. Contractor, G.W.T. Nicholson.

"Linton" Apartment House, corner of Simpson street and Sherbrooke street; 150 feet x 160 feet, in ten storles of brick and Terra Cotta. Probable cost $440,000. Architects, Finley & Spence. Contractors, the Canadian White Co.

"Cavandish" Apartment House, 120 Sherbrooke street; 19 dwellings, 120 feet x 145 feet in three stories. Probable cost $80,000. Architects, Saxe & Archibald. Contractors, Shearer, Brown & Wills.

For E. Roy & Co., at the corner of Carmel avenue and Drolet street; 17 houses forming 34 dwellings, each one 17 feet x 30 feet in two stories. Probable cost $30,600.

Laboratory for the Ecole Polytechnique, St. Denis street; 96 feet x 50 feet, in three stories. Probable cost $33.000. Architect, Jos. Haynes. Contractors, Barbeau & Dufort.

School for the Catholic School Commissioners, at the corner of Richmond street and Grand Trunk street; 67 feet x 48 feet, in four stories. Probable cost $25,000. Architect, J. O. Turgeon. Contractors, O. Martineau & Son.

Church of the Emmanuel Congregation, Drummond street; 72 feet in front, 130 in rear by 175 feet. Probable cost $77,000. Architects, Saxe & Archibald. Contractors, Peter Lyall & Sons.

St. Thomas Church, Sherbrooke street, near De Lorimier avenue; 47 feet x 100 feet. Probable cost $18,000. Architects, Taylor, Hogle & Davis. Contractor, P. & J. O. Brunet.

Permits for all the above, besides many minor works, were issued during the month of June.

THE P.Q.A.A. SKETCHING CLUB.

On the programme for the sketching club on the 23rd of June was a visit to Point-aux-Trembles. Unfortunately the day being very wet was not favourable for the purpose. One of the illustrations shows the interior of the old church which dates from 1705.

INTERIOR OF POINTE-AUX-TREMBLES CHURCH, P.Q.

Externally severely plain and its masonry spoiled with a coat of cement trying vainly to simulate ashlar, the interior shows considerable elaboration for a little country church. The main area as well as the little transepts have a curved wood ceiling, the top of which is flattened in each case. The paterae in the lozenge panels are carved in wood. A wood entablature with carving is carried all round the church. Corinthian columns are employed behind the main altar and beside the small altars in the transepts. The walls of choir and transepts are treated with wood panels with quaintly curved heads. The pulpit, planted upon an angle, looks well enough from a little distance but is of rather gim-crack construction. The proportions of the whole interior are very pleasing. The other

illustration represents a street in the quaint little town of Point-aux-Trembles, many of the houses in which

VIEW IN POINTE-AUX-TREMBLES VILLAGE.

are so tiny that the place would seem to be built half full size. Standing on the sidewalk one can lay ones hand on the overhanging eye brows of these miniature dwellings. The narrow streets that run down towards the river give charming glimpses of the water in the distance.

On the seventh of July members of the sketch club visited the new chapel of the Montreal College in Sherbrooke street. This building, which is being carried out by Messrs. Marchand & Haskell and not yet completed, is of imposing dimensions, being over 40 feet wide and over 140 feet long. Internally the walls, from a height of about 10 feet from the floor, are lined with a very fine yellow limestone. At each end there is on the main wall a great stilted or elliptical arch. This is backed over the altar by a great semi-dome—at the other end by a gallery running across the litlle narthex at the entrance. The roof of open timber is of king post construction with heavy scantlings. The details of the stone work are of a simple Romanesque character.

TRADE SCHOOLS.

MONTREAL, 16th July, 1906.

To the Editor, "CANADIAN ARCHITECT & BUILDER".

Dear Sir,—On a recent occasion you asked me for an opinion regarding the results obtained from employing workmen who had been trained in "Trade Schools", and as to whether the work of such men showed that they had a thorough training.

Your question indirectly opens up the whole question of "Technical Schools", the desirability of their establishment in all important centres, and the practical results of training received under their auspices.

In the first place it has become almost a truism to say that this is an "age of specialization". People to-day need to use their heads as well as hands; and conversely practical knowledge must go hand in hand with theory. To-day it is a struggle between nations for commercial supremacy, and that supremacy will neither be attained nor held by mere chance, but by that nation which trains its mechanics and producers in labor-saving details, prevention of waste, utilization of by-products, training

The Standard Ideal Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QUALITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTATION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

of eye and head as well as manual dexterity. To quote a prominent educator: "The days of self-made men are over. The demands of our day and generation are for men of special preparation and special ability in certain lines; and he is best made who is best trained and best equipped for the chosen calling of life."

There can then be no question about the desirability of the establishment of proper technical schools. In this connection I would refer you to my last annual report of this Exchange, wherein we stand on record as strongly urging their extension and competent endowment by each Province. An institution that will open the way for our young men to become masters of trades instead of spending their lives as day-laborers cannot but be a benediction to each Province.

"Polytechnics" as they were termed in the old country, have been in full swing for over 50 years in Britain, and have been of incalculable benefit to all classes of mechanics. In Montreal we have a school on similar lines—the "Ecole Polytechnique"—with an endowment of $15,000 per annum from the Provincial Government, for which it has to maintain classes in other centres, (Three Rivers, Sorel, St. Johns, etc.); but as only evening classes are taught, and only a limited number of subjects offered (in the building trades, only Carpentry and Stairbuilding, Freehand and Architectural Drawing, Modelling and Plumbing) it is capable of far greater usefulness and extension, with increased resources. Its teaching is *gratis* and some young men of recognized talent have been recipients of its instruction, notably Herbert, the famous sculptor. In New York, the Trades School has developed into an important institution, now taken over and supported by the State. There, the whole of a building is taught, practically and theoretically, with actual bricklaying, plastering, carpentry and plumbing; students are moreover taught to read and understand plans and drawings; and regular lectures are given daily by competent professors in the different trades. By this means a mechanic gets a wider *theoretical* knowledge of a building as a whole, in addition to his special trade, than he would as an apprentice unless under exceptional circumstances.

The concensus of opinion of some of our leading contractors in the Builders' Exchange confirms the following deductions: That the Technical School offers the mechanic the equivalent of his "college training", and leaves him with much the same mental and technical equipment as the doctor or lawyer who has just graduated from his college course. Neither is of much value without the practical experience which results from actual, active operation in his particular line. A mechanic who in addition to serving his apprenticeship takes up a technical course, either concurrently or subsequently, is a more valuable man in every way than another who works only by "rule of thumb". At the same time a mechanic who studied *only* at such a school, without practical work outside, would stand on a par with a doctor who had passed his course but never practised; he would be apt to be a mere theorist and ignorant of the hundred and one little details which can only be mastered by contact with actual conditions.

By all means encourage the multiplication of Technical Schools as a most valuable adjunct to, but *not a substitute for* thorough apprenticeship. Faithfully yours,

J. H LAUER, Secretary,
Montreal Builders' Exchange.

The following are extracts from the annual report to which Mr. Lauer refers:—"Technical Education—a worthy field for practical philantropy, following the lead given by Sir. Wm. Macdonald in other branches. The crying need of all trades to-day is for *competent* mechanics. The Unions, whose pride it should have been to admit *only such* to full membership, have exerted their influence steadily in the opposite direction, in the persistent effort to establish an artificial uniformity both in output and wages—a glaring injustice to the *capable* mechanic as well as to the employer. All incentive to self improvement is thus taken away from the worker.

The practical abolition of the apprenticeship system and the fatal facility with which many things are learned superficially, from laying bricks to legislating for the nation, has filled the land with "half-baked" men—men trained for *nothing in particular* and good for *nothing in general*.

The practical solution is for Employers to revert to the former well-tested system of "articled apprenticeship", and to take a personal interest in training the young men so bound, making this youthful period of life attractive by encouraging friendly competition in technical schools."

EMPLOYMENT OF UNION LABOR.

At a meeting of the Montreal Catholic School Board, held on May 30th, a request was considered from the Montreal Trades and Labor Council asking that only union men be employed henceforth in the various works of construction required by the board. After a brief discussion, it was proposed that the request be granted, but the motion was lost, and the matter was referred to a committee.

The following letter, from the Builders' Exchange, is written in reply to this action of the Board:

5th June, 1906.

PAUL G. MARTINEAU, Esq.,
Chairman Catholic School Commissioners.

DEAR SIR,—I note by the public press of the 31st May that at the last meeting of your Board a request was made by the Montreal Trades and Labor Council, and supported by Commissioner Alderman Gallery, that henceforth only Union men be employed in the various works of construction required by your Board; and that such request was ultimately referred to a sub-committee.

At the request of the Board of Directors of the Builders' Exchange I am instructed to enter a formal protest against any such action on the part of your honorable Board.

This Exchange comprises the leading contractors in the building trades of Montreal, with an equally large representative membership of French, Irish and English-Canadian contractors, large employers of labor, and also large contributors both individually and collectively to the rates and assessments of this City.

As ratepayers and voters, who have at least as much right to the consideration of your honorable Body as the voters who presented the above unreasonable request to you, representing as they do only a *section* of the workers of Montreal, I beg to respectfully submit:—

1. An emphatic protest against any effort to drag our public bodies down to the level of "electioneering campaign" tactics.

2. The question as to by what right the Labor Unions claim any *monopoly* of Labor? The Unions do not comprise even 50% of the workers; are the larger half of the working-men to be deprived of the right to earn their daily bread at the dictation of certain labor "bosses," who in most cases are not even Canadian citizens, but merely puppets worked by the wire-pullers from the United States?

3. That the policy of this Exchange is to protect the rights of *all* workers from despotic control, irrespective of its connection with unions or other labor-organizations.

4. If it is the unquestioned right of the worker to sell his labor at the best price he can obtain; to work or to quit work at his option; to buy or refuse to buy where he will; then it is equally the right of the employer to employ whom he will, according to merit and ability, irrespective of connection with unions; or to refuse to buy the labor of certain persons or organizations if undesirable.

5. The right to work belongs equally to the non-union man. He, too, must live and support his family. Shall bread be taken out of his mouth, shall he be eaten or killed (and this is no idle piece of imagination) because he does not see things even as others, and refuses to join a union?

My Board therefore appeals to you with confidence as an influential public body, directing the educational affairs of the large majority of our fellow-citizens, to fearlessly assert the unalterable principle of justice to all workers alike—ignoring the distinction of "union" or "non-union" labor; and also on behalf of the members at large of this Exchange desires to protest against unnecessary and excessive expenditure of school-taxes in payment of an artificial rate of wages imposed by a would-be monopoly of Trades-unions.

I am directed to ask you to kindly consider the subject of this letter at your next meeting, which I understand takes place on Tuesday 12th inst., and to let me hear from you at your earliest convenience.

I beg to remain, Sir,
Your obedient servant,
J. H. LAUER,
Secretary.

ADVENT OF THE PORCELAIN ENAMELED WATER CLOSET TANK.

As the old fashioned wood rim bath tub and the unsanitary wood encased lavatory have been forced to give way to the beautiful porcelain enameled roll rim bath and the open, one piece lavatory, so the wooden closet tank is being supplanted by the handsome, sanitary and serviceable porcelain enameled tank. Except in the case of very cheap work, the indications are that the wood tank will shortly be seen no more, the enameled tank having been demonstrated to be so greatly superior to it in every way.

We have come to recognize sanitation as one of the most important elements of civilization, and are beginning to understand that articles made of wood have no place in the bath or toilet room. Dampness will crack the wood, and too much heat has a likewise injurious effect. It is therefore very evident that vitreous, glazed materials, such as porcelain enamel, are in every way superior to fixtures which have about them any parts of wood, marble or other porous substance. That the porcelain enameled tank is destined to become as popular and universal as the porcelain enameled bath tub goes without saying, therefore. The public takes more interest in matters pertaining to the bath, health and cleanliness than heretofore, and along with this interest, more attention is bestowed upon the particular devices and equipment of bath and toilet rooms. We are made aware of facts

WROUGHT IRON FENCE

Make a Neat Appearance, Form a Perfect Protection and will last a Life Time

Designs from $1.00 a foot upwards. Send for Bulletin No. 23

CANADA FOUNDRY CO., Limited
Head Office and Works: TORONTO, ONT.
District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

ARCHITECTS!

SPECIFY — SPECIFY

LUXFER WINDOW PRISMS

LUXFER SIDEWALK PRISMS

LUXFER FIREPROOF GLASS

Do not fear a little expense for good material.

It will pay you in the long run.

Your work is more satisfactory to your client and he is better pleased with what he has got.

Write us for prices or other information.

MARBLE MOSAIC FLOORS

GLASS MOSAIC WALLS

ART GLASS

Luxfer Prism Company, Limited
100 King Street West, TORONTO

and fundamentals relating to hygiene of which we formerly never dreamed. We realize as never before how plumbing and sanitation has advanced. We appreciate the dainty, immaculate bathroom with its walls and floor of tile, its bath of pure white enamel, the dainty one-piece enameled lavatory, and the porcelain enameled closet which has proven to be such an important step forward in modern sanitary appliances. We therefore welcome with thorough appreciation, the advent of the enameled closet tank, knowing that it adds to the health, cleanliness and beauty of the bath and toilet room.

The advantages of the porcelain enameled tank over wood tank are so numerous and evident that it scarcely would appear necessary to call attention to them. A few important points may be cited, however, inasmuch as the subject is one of marked importance in sanitation.

The wood tank, as everyone knows, is very easily scratched, marked or defaced, the surface being polished or varnished, and the polish will rub in cleaning. Moreover, the tank is made in several parts. The linings in wood tanks in most cases are of 8 or 10 oz. copper, through which the water will in time eat its way. When this occurs the wood is destroyed, the water leaking through the seams, destroying the polish and running over the floor of the bathroom.

The great advantage of the enameled tank is that it is made in one solid piece (the top of course being separate), and is enameled both inside and out, making it an ideal fixture for the service to which it is put, as it becomes, as it were, a porcelain water vessel, and does not sweat, crack nor craze, is not affected by heat or cold, has no lining to weaken and break away creating leaks and can be readily cleaned both inside and out. The beautiful design and finish of the porcelain enameled tank make it a most attractive article. In short, the advantages of the enameled tank are the advantages of the china water vessel over one of wood and copper.

The Standard Sanitary Mfg. Co., Pittsburgh, Pa., has designed and placed on the market several different styles of porcelain enameled tanks for low down closets. The tanks are made in various attractive designs, and can be furnished for syphon jet, syphonic or washdown closets.

In the matter of cost the enameled tank is slightly higher than the wood tank, which is of course to be expected, as the former is coated both inside and out with a heavy body of porcelain enamel, and in its construction only the very best materials are used. Moreover, the life of the wood tank is short, while the enameled tank will in the ordinary course of events, last a lifetime. There is really nothing to affect it, owing to its being impervious to heat and cold, no linings to rust out, etc. the durability of porcelain enamel being well known.

Situation wanted by competent architectural draughtsman, 4 years English training. Winnipeg experience. Box 347, Winnipeg, Man.

LOW SUMMER TOURIST RATES WEST.

During the entire summer the Chicago and North Western Railway will have in effect very low round trip tourist rates to Colorado, Utah, California, Oregon, Washington and British Columbia points. Choice of routes going and returning with favorable stop-overs and time limits. Very low excursion rates to the Pacific Coast from June 25th to July 7th. For further particulars, illustrated folders etc., write or or call on B. H. Bennett, General Agent, 2 East King Street, Toronto, Ont.

"ATLAS"
BUILDING BLOCK

THE ONLY CONCRETE Building Block forming continuous "dead air" space (or hollow) wall, the entire length of the wall, including angles. Well "bonded" to wall. Warm in winter. Cool in Summer. FIRE, FROST, and WEATHER proof. EASY to build, having all the facilities of brick or stone work, for bedding plates, sills and bond timber, for joists, &c. IRRESPECTIVE of face work. EASY to manufacture, no expensive machinery being required. Profitable to user and producer.

If a PARTIAL air space in a wall is beneficial (in any way), the WHOLE, or a continuous air space, must be MORE SO.

The ATLAS BUILDING BLOCK is rendered more DURABLE and TENACIOUS than ordinary concrete by the use of I.N.D Chemical Compound—a cheap and profitable mixture to use in all concrete construction (at a cost of 40 cents per cubic yard.)

Special plans and estimates prepared, for all concrete structures, by

JOS. HOGUE, 965 BERRI STREET MONTREAL

We have the most perfect fitting LOCK-JOINT COLUMN made. Write for Catalogue and prices.

DETROIT COLUMN & MANUFACTURING CO.

The largest and most extensive Manufacturers and Shippers of COLONIAL COLUMNS AND COMPOSITION CAPITALS in the United States. Write for prices and discounts.

DETROIT MICHIGAN

Style No. 27 Style No. 40

WE FURNISH COLUMNS IN ANY SIZE OR LENGTH

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

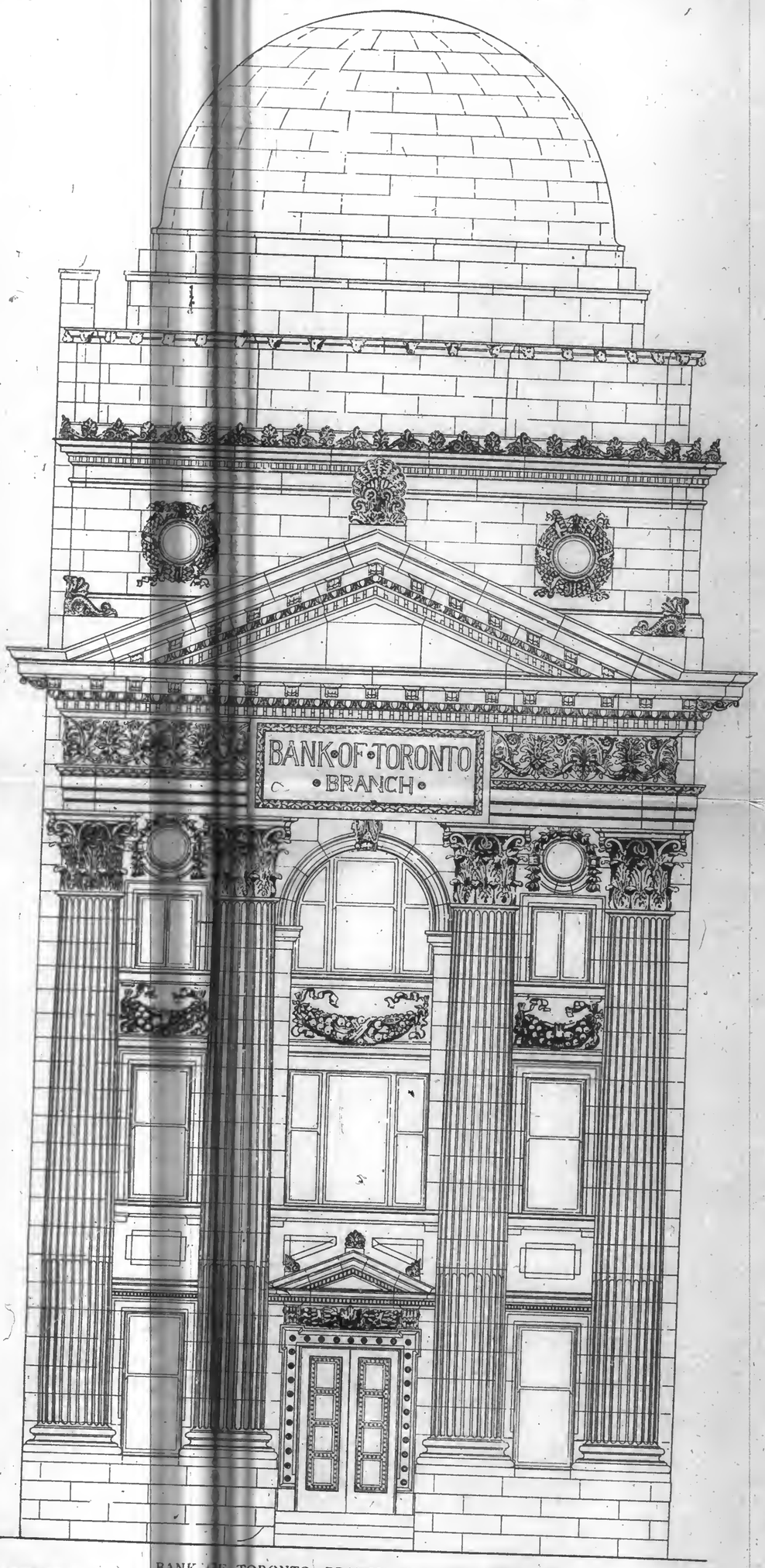
in any required size.

HEAD OFFICE:
36 Toronto Street, TOROTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

VIEW FROM DONALD STREET.



BANK OF TORONTO—BRANCH ON YONGE STREET.

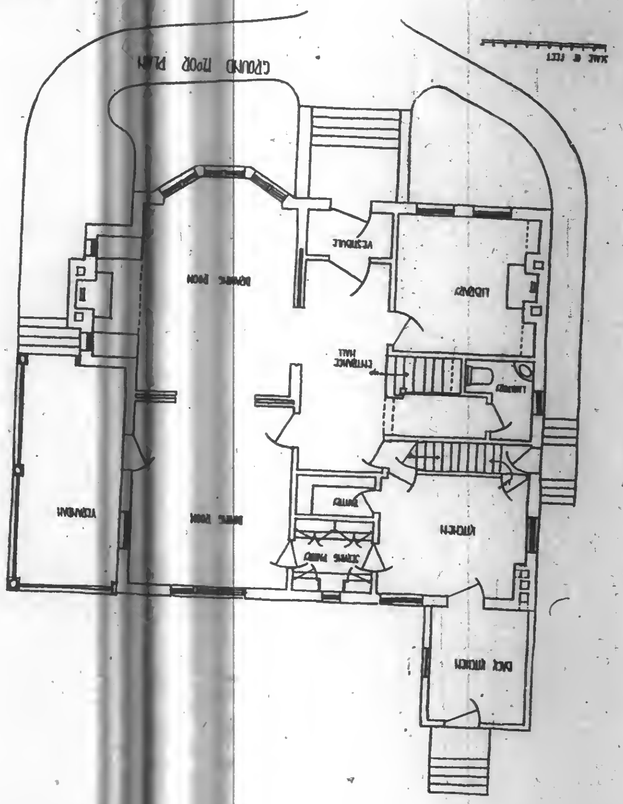
MR. E. J. LENNOX, ARCHITECT, TORONTO.

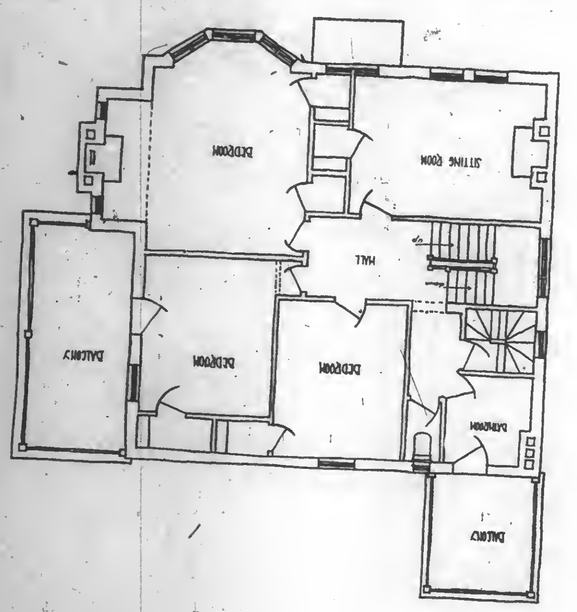
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1906

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JULY, 1908

RECTORY FOR THE CHURCH OF THE HOLY TRINITY, WINNIPEG.

MESSRS. DARLING, PEARSON & OVER, ARCHITECTS, WINNIPEG.





The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 224. AUGUST, 1906.

ILLUSTRATIONS ON SHEETS.

House for J. C. Gordon, Esq., Winnipeg.—Messrs. Darling, Pearson & Over, Architects, Winnipeg.
House for C. W. Colby Esq., Montreal.—Prof. P. E. Nobbs and Mr. D. R. Brown, Architects, Montreal.
Cottage on a Hillside.—Prof. P. E. Nobbs, Architect, Montreal.
Ontremont Convent, near Montreal.—Mr. J. Z. Resther, Architect, Montreal.
Photographs in France and Italy by Mr. J. P. Hodgins, Toronto.

CONTENTS

Editorial	113	Montreal Notes	121
Questions for Strikers	114	The P. Q. A. A. Sketching Club	121
A Talk on Cement	115	Some Recent Building Permits in Montreal	122
Convention of Painters and Decorators	116	Intercommunication	123-124
Our Illustrations	117	The National Association of Master Plumbers	125-126
The Seventh International Congress of Architects	118	Provincial Builders' Exchange	127
Illumination of a Warehouse	119-120	Builders' Exchange Outing	ix

Quiet Lunch Rooms.

If there is one thing more than another that makes daily life in the city disagreeable it is the necessity of lunching in the hot, crowded and noisy lunch rooms which alone are open to the ordinary business man. It is safe to predict that if any one will build a pleasant airy room, of size sufficient to keep people decently apart, with a kitchen properly cut off and ventilated, and properly fitted up so that the frequenters will know, (as they will), that their food is cleanly prepared, he will command the trade and may demand his price, (within reason). An old shop, a hundred feet from front to rear is not good enough. One does not want to eat lunch by electric light, in a tunnel, at one end of which is a superheated and infraventilated kitchen that discharges, with every opening of the service doors, a steamy air to be stirred up by the fans which do not pretend to remove air but only to move it that it may take up a little more moisture and make perspiration not quite so sensible. The hum of the fans, the scurry of attendants who have to go the whole length of this ill-planned apartment for every order, makes such a grounding of noise that conversation can only be carried on in loud tones, and as each one tries in self defence to raise his voice above his neighbour, the din,—for such it is, though one does not recognize it as such until on some occasion the fan stops and a hush seems to come over the room—the discomfort of it all makes lunch anything but the time for unbending and refreshment that it ought to be.

As a change from this one may go into a cellar that smells like the hold of a ship and occasionally find a cockroach done to death at the bottom of one's savoury soup; or one may sit in the kitchen itself.

Here is a legitimate field for architectural invention. The architect as an advertiser—proffering his services with the implied but unproved assumption that they are better than his neighbour's—is not in good repute; but the architect as the inventor, seeking to find how to produce what has not been produced before, is in a different position. This is the theoretical groundwork of the architectural competition; the reason why, when there is a problem with new elements or occasion for invention, it is thought right that young men with new ideas should be given a chance to show what they can do. And as it is time some new idea of the downtown restaurant was presented, the architect who can develope one and impress it upon the attention of some one who will carry it out will be welcomed in doing so by everybody.

There are many ways in which the problem can be agreeably solved. The problem of conveying supplies and the public to a roof garden is not too difficult or expensive for the occasion, and the utilization of the top storey in this way will be found money in many cases. But a more obvious utilization would be the insertion of a two-storey building in the waste space in the interior of a block. Here, with a mere entry on the street and a delivery at the kitchen door, might economically be erected a sky-lighted upper room upon a high and dry basement which would make an ideal restaurant; high, quiet, clean and well ventilated; depending for its attractions of appearance not upon the hideous splendour of the conventional restaurant but on constructive elegance and a roof that could be

mostly dormers or, if shaded by tall neighbors, might be mostly glass.

The Worship of Mere Bigness.

At last the daily press is beginning to say something in the way of sound criticism upon the senseless idea that seems to possess people in this country that our happiness is to be found in rapid growth. Grow we must, but it is the kind of growth implied by this emulous haste to be big—the kind of popular mind that is implied by it—that makes the judicious melancholy. The Toronto *Globe*, commenting upon the appointment of a Commissioner of Publicity and Industries for Toronto thinks that "the notion that a few more factories pulled in from outside towns, a few more miles of streets and buildings, a few more people gathered together within the city limits would add to the greatness of the city and to the honour of its citizenship" is "grotesque folly". The *Mail and Empire* is strong upon the unfriendliness to other towns of trying to tempt works from them, and the unfairness to existing manufactures in Toronto to offer special inducements to others to come in. All this is delightful to read; especially the argument of the *Globe* that "the city itself—the opportunities and comfort and wholesomeness of its life—is its own best publicity agent"; that, "by improving the conditions of life in the city," the City Council "will help to make Toronto not only a magnet to outside enterprises but also a place worth while for its own citizens." There is nothing vulgar about *that* idea; *a place worth while for its own citizens.* What a vision of dignified enjoyment of life this calls up, compared with that other idea of haste to be big, to beat some other town in size—to be rich, if you will. Does that last possibility invalidate all protest? There is no truer philosophy of life than that those who "covet after" money (or desire it unduly), pierce themselves through with many sorrows." And it is unquestionably an undue desire for wealth that makes its attainment condition life so as to postpone the enjoyment of the passing years.

It is common talk, among those who knew Toronto thirty years ago, that the present city, with all its "improvements," is not nearly so pleasant to live in. What are the improvements? In general they are material; light, power, means of locomotion; not civic improvements in the true sense of the term, but commercial ventures of corporations formed not so much to contribute to the happiness of the public as to profit by their necessities; and the noise, dust and crowding together, which are the disagreeable elements of city life, are so much accentuated by some of these improvements that to them may be attributed a principal share in the gradual growth of the unpleasantness that distinguishes the Toronto of to-day from the pleasant city of thirty years ago.

Mere size and the accompanying disintegration of society have of course an important place in the changed conditions of life as cities grow. These are unavoidable and it is no doubt necessary to give up with a sigh some of the former charms and turn our attention to making new ones which will mitigate the evil of mere size. To aim principally at increasing it is certainly not the way.

Here is what the *Globe* has to say upon the subject, after advocating the adoption of a definite policy of action with regard to propositions that have already been made for the beautification of the city by a scheme of parks and driveways, lake-front and island improvement, beauty-spots, playgrounds, &c.:

"To deal with these problems would require intelligence and constructive statesmanship far beyond that involved in the appointment of a Commissioner of Industries. It is by solving these larger problems, by improving the conditions of life and beautifying its surroundings, by letting some touches of nature get back into the lives of the children who must play in the streets and of their parents who must toil in the factories—it is by progress in ways such as these that Toronto will, indeed, become a great city, and not by mere breadth and bigness."

This is the gospel of civic improvement in brief. This must play a part, and a fundamental part, in any policy for a city's growth. Without it—to increase the labourers in a city, (and we are all labourers), and make no provision for their life—is a senseless and sordid policy that ought to be, and we may hope is, out of date. If an effort is made to increase a city's size, a parallel effort should be made to prevent greater size making the city less fit to live in. The appointment of a Commissioner of Publicity should not be made without appointing also the Commission for Civic Improvement which was so forcibly commended to the city of Toronto by some of its greatest citizens last January. The city will grow without a Commissioner but it cannot become great without the Commission. To add to the traffic on the old lines will only increase the unattractiveness of a city which is already too big for its present plan. There must be new lines of traffic run by a Commission with power to buy and sell land for the purpose. For a great part of its work we are assured such a commission would only want a loan; but it need not be required to be entirely self-supporting for it is likely to be a better agent for publicity—a greater "magnet to outside enterprises"—and in a more permanent and wholesome manner, than the publicity commissioner himself.

QUESTIONS FOR STRIKERS.

A friend of mine, whom I have known for years as a carpenter's foreman but who is now an employer, raised a couple of questions the other day, apropos of the carpenters' strike in Toronto, which seem worth passing on.

The first question is: Since perpetual rises in the wage of carpenters seem to better them but little, who gets the money. He observes that a house he bought some years ago for $600 is now worth $1,500, although it is not as good a house as it was, and he has come to the conclusion that he has got some of the money. And, if the value of this house has risen by mere pressure in the atmosphere of prices, he argues a prompt response in the value of houses which are being built when the strike and the rise in wages occurs. Thus, if wages rise 10 per cent., a house, which was to cost $2,000, promptly becomes worth $2,200. The owner is none the worse and probably a little the better; for these uncertainties in the building business require the insurance of plentiful value for houses. But, it will be said, the strikers are richer too. Are they? That is the question. They get more money, but they have raised prices in getting it. They have to live in the houses of which the rent has gone up 10 per cent. Their butcher and baker are in the same position: but these can distribute their rent in the price of bread and meat, so that it is repaid to them. By whom? Apparently by the wage earner. It looks as if the wage earner if he succeeds peacefully in getting his rises, will neatly dispose of everything he gets, without being any the better for it; while if he agitates much, so as to scare prices up unduly, he will be in a worse case than he was before.

The second question is concerned with the limitation by the unions of the number of apprentices in a trade. This, for example, in the bricklayers' union, is one apprentice to every seven journeymen.

Now the average family consists of five—the parents and three children; so that the seven journeymen have twenty-one children, of which only one boy may work at their trade. There are other trades of course, but they are equally blocked, and equally stocked with children. It is a clear case (speaking in averages) of twenty-one children to one apprenticeship. Of these one half are girls, perhaps a little more; which seems to be a provision of nature for the comfort of the world. Suppose there are nine boys, what becomes of the other eight, born to be craftsmen and denied the right to learn a craft. My friend is nervous about the capacity of the jails. Honest beggary he says is of no use, because, though the advance of the world has made no difference in the rich man—*he* still fares sumptuously every day—the beggar can no longer lie at his gate but is moved on.

Doubtless the young men find work, but that is not the whole question. There is a suspicious parallelism between these two questions which suggests a doubt whether all this forcible direction of work and wages into artificial channels is for the real interest of wage earners, who have to pay every cent of the artificial price and make nothing out of it. Would not nature be more kind—the natural law which gives good wages to a good workman, and the best wages to the best? This provides the margin of profit in all trades, and keeps prices at their natural level; inasmuch as one has not to pay for poor work the same price as for good?

A TALK ON CEMENT.*

CONCLUDING PART—CONCRETE.

Our first article on this subject treated of the nature of cement and its use for mortar. The second treated of testing. In this number we propose to speak of the second use of cement, viz., for concrete.

A concrete consists like ordinary walling of mortar and stone or its equivalent. The function of the mortar is greatly increased so that it constitutes about 2/3 of the wall, wrapping the other material all round like a mould; hence the mortar is called the "matrix" or mould (literally, womb), and the other material—stone, shingle, cinders, slag, etc.—is called the "aggregate."

The great thing is to get the concrete solid, without any interior honeycombing. This can be done by proportioning the three constituents of the concrete—cement, sand and stone (or other aggregate, but we may take stone as the type)—so that each fills completely the interstices of the other. And, if the stone is crushed so as to be of various sizes, and the sand has grains of various size, these will fit into one another and help to solidify the mass.

The voids in sand and the voids in aggregate will vary from twenty-five to fifty per cent. They are to be measured accurately by filling a water-tight vessel with the sand or aggregate and adding water until it flushes even with the surface of the contents of the vessel. The increase in weight due to the added water, compared with the volume of that weight of water, gives the volume of the voids in the sand (or of the cement required to fill them), and is expressed as a percentage of the sand.

Suppose it is desired to produce a solid concrete, knowing the voids to be—sand, 35 per cent.; aggregate, 40 per cent. The volume of sand will shrink about twenty per cent. when wetted, and the volume of cement about ten per cent. The voids in a volume of wetted sand are therefore 35/100 of 80/100 or .28. The volume of cement, when wetted and reduced ten per cent., becomes .90. It is obvious that three volumes of sand, with voids equal to .28 × 3, or .84, will be properly filled by one volume of cement. The mortar or matrix will therefore be 1 to 3. The volume of this mortar will probably be about equal to that of the wetted sand, or 80/100 of 3=2.4 volumes. This is just equal to the voids in six volumes of the aggregate described above, in which the voids were .40 of the whole. This means that a 1:3:6 mixture will give solidity.

Angularity is an advantage in the aggregate, as the bond with the cement is then strongest. For this reason crushed limestone is to be preferred to such aggregate as gravel or water worn shingle even when these are free from the loamy or earthy matters which are apt to be an objectionable accompaniment to them. Stone should be freed by screening from the dust that accompanies crushing. Cinders and slag have the advantage of lightness. Cinder concrete only weighs about 100 pounds per cubic foot, while a cubic foot of limestone concrete weighs about 150 pounds. Cinders, therefore, make a good aggregate for concrete flooring; and for other purposes, where strength is not necessary, cinders and slag have the advantage of economy. Aggregate masses more compactly (as already stated), if it is irregular in shape and varied in size. It should not be larger than two inches in any direction.

Sand should be clean, sharp and coarse, but preferably of grains varying in size. It should be free from clay, loam, sticks or other impurities.

Water should be clean and free from sulphuric acid or strong alkalies. City water has a standard quality that is known; but in country work the character of the water is worth investigation. A factory two or three miles up stream has been known to spoil a batch of concrete.

Mixing by hand requires tight platforms of sufficient size to accommodate men and materials for the progressive and rapid mixing of at least two batches of concrete at the same time. Batches should not exceed one cubic yard each, and smaller batches are preferable, based upon a

*Based on a paper on The Cement Industry of Ontario by Mr. P. Gillespie in the report of the Bureau of Mines of Ontario; Vol. XIV, Part I.

multiple of the number of sacks to the barrel. The sand should be spread evenly upon the platform, then the cement upon the sand, and all mixed thoroughly until of a uniform colour. The water necessary to make a thin mortar is then added, and the whole spread again. Upon this the aggregate is thrown, after having first been wetted down if dry. The mass is then turned with shovels or hoes until thoroughly mixed; the aggregate covered with mortar. This will probably require four turnings. Sometimes the sand, cement and stone are spread upon one another, in that order, without water. Then the water is added and the whole mixed thoroughly as above.

In machine mixing, which is desirable when the volume of work is large, the same process should be obtainable, viz., a thorough dry mixing of the sand and cement before the aggregate and water are added; and the machine should be so constructed that the mixing may be continued until a satisfactory and complete incorporation is accomplished. Concrete of the right consistency will not, when dumped in place, require much tamping. When spaded down and tamped sufficiently to level off, it should quake freely like a jelly. The tamping must be done at once before the initial set begins.

The top of each course should be levelled to a plane as nearly as possible at right angles to the line of pressure, but its surface should not be smoothed in the process but left rough that the next course may bond the better with it.

An uncompleted course should be left with a vertical joint where the work stopped. Vertical joints, to allow for expansion and contraction, are made in long exposed walls at intervals of thirty to fifty feet, or longer when the concrete is reinforced. A temporary end is made for these sections of wall by setting up a form or plank and finishing a section against it. The plank is then removed and, when the next section is built, the new concrete is placed against the old without mortar flushing. "Locks" are used to mitigate the disadvantage of the straight joint.

It is essential that the form shall be unyielding. For this end it must be braced or tied together by means of wire or rods. The material should be dressed lumber, secured to the studding or uprights in horizontal lines. Planking once used in forms must be cleaned before being used again. In dry but not freezing weather, the forms should be drenched with water before the concrete is placed against them.

Forms must not be removed for forty-eight hours after all the concrete in that section has been placed. In freezing weather they must remain until it is certain that the concrete has had sufficient time to become thoroughly set.

A facing for the wall—of mortar of the same proportions as used in the concrete, or mixed with a special form of aggregate—can be placed next to the forms immediately in advance of the concrete. The usual finish is a wash of grout, of about the consistency of whitewash, mixed in the proportion of one part of cement to two of sand, and applied with a brush. The same finish should be applied to seal the pores in wall tops which are not finished with a coping of stone.

Cracks in concrete lead to deterioration from the action of water and frost. To prevent this reinforcement is necessary. Reinforced concrete when properly built will not crack like plain concrete. As it is also not susceptible to atmospheric influences like stone masonry, Mr. Gillespie concludes that re-inforced concrete is the only form of construction that is really permanent.

The other advantages of this form of construction are thus summarized in an editorial article of The Engineering Magazine:—

> "Among the many advantages of concrete-steel may be mentioned cheapness as compared with other types of massive construction, lightness, economy of space on account of thickness of walls, capacity for carrying heavier loads, ready adaptability to any desired form, speed of construction, fireproof qualities, and safety on a very poor foundation material, since the structure hangs together as a whole, and when overloaded does not collapse suddenly, but tends to deform gradually."

On the other side it should be said that, however scientific the system, it is difficult to use it scientifically for want of proper data. Mr. George B. Post, in the discussion on the subject at the International Congress, said that "those in large practice as architects in the United States use ferro-concrete with considerable trepidation, from the fact that there are no established constants that can be used in computing the strains." The position of the neutral axis in different conditions and under different loadings seemed also to give Mr. Post and others in large practice as architects anxieties from which some more courageous builders are free. The quality of the ingredients also and the manner of mixing contribute to their trepidation. "In fact," Mr. Post added, "their opinion of the material was very much like that of the distinguished Mr. Weller with regard to veal pies—they were 'werry good things when you knowed the lady as made them.'"

In the matter of reinforced concrete at present, the maker of the pie is usually the systemman who supplies the reinforcement. A proper review of the different systems of reinforcement is beyond the scope of this article. They are described in full with illustrations in the various works on concrete construction; and one of these is likely to be in the hands of any architect or builder who is working on a scale sufficient to require their aid.

Lead wool is a material recently used to a considerable extent in Europe for the joints of gas and water mains. It consists of fine threads cut from virgin lead, and is sold in strands about 3 feet long and weighing about a pound. Yarn is first put in the joint in the usual way but to a greater depth, and then the lead wool is calked in without heating. Each turn of the wool around the pipe must be well calked before the next one is inserted.

There are many quarry operators who imagine there is such a thing as a cheaper cap for setting off dynamite charges. This is like the man who curtails his food allowance, or the one who "bites off his nose to spite his face." There is no cheaper than the very best. What you are looking for is the cap which will explode the entire charge at once. The amount of powder wasted in partial explosions by the use of inefficient caps in the lime and cement quarries of this country would represent a fortune every year. This is one case where you are looking for the best to find the cheapest. *Rock Products.*

OUR ILLUSTRATIONS.

HOUSE FOR MR. J. C. GORDON, ASSINIBOINE AVENUE, WINNIPEG. MESSRS. DARLING, PEARSON AND OVER, ARCHITECTS, WINNIPEG.

The key to the plan of this house is evidently the clear outlook to the river in the rear. The kitchen department therefore comes to the front, compressed into the projection on the front, which, being a projection, clears the lookout from the front verandah and the rest of the house, and gives independence in elevation for the awkward diversities which are apt to occur between different departments of the plan. The high line of the window sill in the servants' bedroom is a note of distress on the other side of this question; a suggestion of caution—excessive caution one would say, considering the effect upon the room—in connection with the freedom of this window from over sight from the rest of the house. The kitchen lookout in front is stopped too, but there is no severity here as it is clear at the side. The rest of the house is pleasantly grouped round the staircase hall. The spacious verandah overlooking a private lawn appeals to the imagination in the present weather. This ought to be a typical Canadian verandah plan. We are an open air country and our verandahs are rooms out of doors. To plant this room as is usually done at the front door, in the way of arrivals, exposed to the dust, noise and publicity of the street, is not the proper idea at all.

HOUSE FOR C. W. COLBY ESQ., MONTREAL. MESSRS. P. E. NOBBS A. R. I. B. A. AND D. R. BROWN, ARCHITECTS; MONTREAL.

A COTTAGE ON A HILLSIDE FOR E. RUTHERFORD ESQ. PROFESSOR P. E. NOBBS, ARCHITECT, MONTREAL.

The coloured originals of these drawings get little justice from photography, but the plans are fortunately decipherable. These show that the Montreal house turns its back to the street, while its family rooms—dining-room and drawing-room, with sitting-room and balcony above—are turned to the view. This house is interesting as a study of simplicity that is not formal, or freedom within the limits of a street front on a sheer building line.

The cottage on a hillside has this freedom unrestricted by limitations of site. It is not however, unrestrained. Each elevation is quiet; but nothing is formal. No feature seems to be forced from its natural position, nor are there any extraordinary features. The slight touch of formality in the front door is charming. In all other respects the exterior features are quite simple but the elevations are full of life and interest and are well worth study.

If one may venture to sum up under one head, (as a point for study), the excellence of this design, as compared with so much Canadian work that can rank as an architectural effort, it is in the matter of scale. Anything in the nature of a cottage in this country, (following the United States), has always some Brobdingnagian feature that knocks out of it any claim to be "a cottage of gentility"; some swaggering bay, with an avalanche of roof swooping round it; or a "porch" that takes the air pompously to be seen of men.

Vulgar pomposity is for palaces, but cottages must be refined to please; and one great secret of refinement is a modest scale, consistently adhered to.

OUTREMONT CONVENT, NEAR MONTREAL. MR. J. Z. RESTHER, ARCHITECT, MONTREAL.

Mr. Resther's handsome portico is a beautiful object, and no doubt, a satisfaction to beholders, especially his clients; but we must confess to an admiration for the simplicity of the old buildings built of this stone, and a regret that the sentiment felt for them by architects in Ontario does not seem to be fully shared in the province where the stone is used. The old path in this work is one which there can be no shame in following. It is good in all styles, for its excellence is in the breadth which is a border-land common to every style in its simple work. To try for anything else is up-hill work with coarse material. It is interesting to note the departure from the old conventual manner employed here; the progressive projection towards the centre, in harmony with the new idea. The composition is certainly spirited. But Mr. Resther has been guilty of making a comfortable top storey, whereas the law of true Renaissance composition is that this must be uncomfortable. One can see how it would improve the grandeur of the building if the top storey were uncomfortable. It is better to sin against style than utility. But is there not a third way, in buildings that ought not to be expensive, viz., to hold to the inexpensive manner that is so charming in the old work?

SELECTIONS FROM PHOTOGRAPHS TAKEN IN FRANCE AND ITALY BY MR. J. P. HODGINS, TORONTO.

The Piazza della Erbe, (the market place), of Verona, is given by Dr. Steübben as one of his examples of the irregular shape of old places of this kind in Europe. It is wider in the middle than at the ends and wider at one end than at the other.

The view of Versailles is taken on the grand vista, from a spot that cannot be distant from the palace more than half the length of the vista; near the artificial water that forms the object of interest in the middle distance of the view. The scale of the grounds, all laid out in formal avenues, may be gathered from this. Mere size kills enjoyment of the palace, which depends as a design upon composition, and is too large to be seen all at once, except as a distant object. But with the grounds it is different. Size is their merit. In the soft French atmosphere the aerial perspective of long rows of trees has a kind of beauty one cannot see elsewhere; realizing a magnificence of conception which we are accustomed to expect only from the inexpensive art of the scene-painter.

BUILDING RESTRICTIONS IN MONTREAL.

The Montreal City Council has recently passed the following enactments regulating the construction of buildings, etc., in various thoroughfares:—

"It shall not be lawful to construct, occupy and maintain any factory or livery stable or other similar place of business, nor shall it be lawful to fit up or repair any existing buildings to be used as such, on the following streets, namely:

"(1) Both sides of St. James and St. Antoine streets, from Bourget street to St. Ferdinand street.

"(2) The east side of Ferdinand street; west side of Bourget street; both sides of St. Peter, Metcalfe, Agnes streets, Park terrace, Park avenue, and Annie street, from St. James street to St. Antoine street.

"(3) The east side and west side of Beaudoin and DeLinelle streets, between the Lachine canal and the G.T.R. Company's tracks, and all the streets presently existing or which may hereafter be established within the district bounded by Beaudoin street, the G.T.R. Company's tracks, DeLinelle street and the Lachine canal.

"Every new building erected on the lots fronting on either side of Guy street, shall have a frontage of ashlar or cut stone or cement, or iron or pressed brick of the best quality, capable of supporting a pressure of 750 pounds per square inch, or of any other durable and incombustible material (to the exclusion of wood, wood and brick, wood and stone, wood cased with sheet-iron, for external walls). Ornamental terra cotta or cement may be used to ornament the frontage. The cornices shall be of sheet-iron, copper, stone, brick or cement."

THE SEVENTH INTERNATIONAL CONGRESS OF ARCHITECTS.

By a Correspondent.

Even the most energetic and ubiquitous of reporters would have found it impossible to attend all the meetings and functions arranged for the edification and entertainment of the members of the 7th Congress of Architects. These had to be arranged to overlap because of the large number attending—some 1,700—and because everything had to be crammed into the space of one week. And a busy week it was, mornings and afternoons and evenings being all filled up—in many cases doubly and trebly—so that members had to make a selection of the subjects and places of most interest to them. The evening functions to which all were invited were very crowded. The making of all the necessary arrangements must have involved an enormous amount of thought and labour, and the smoothness with which everything moved showed how efficiently the work was done. The weather was ideal throughout.

That these Congresses accomplish the purpose for which they were designed may be assumed from the fact that they continue to be so largely attended by busy men from far distant points. It appears to be decided that the next one—in 1908—is to be held in Austria, and Mr. Cass Gilbert put in a claim for the succeeding one being held in the U.S.A., while the representative of Japan looked forward to welcoming his confreres to the land of the rising sun. The catholicity of art is emphasized by the large number of nationalities represented. Locally and individually architects may have their petty rivalries and jealousies, but there is no international rivalry of this sort, and a true international rivalry in art is a large-souled thing that can only be productive of good. Such Congresses as these must tend to further the ideas of *l'entente cordiale* and Imperial federation just as certainly in their degree as the inter-parliamentary one now being held in London. Accredited delegates were sent by nearly all of the Governments of Europe and by a large number of societies and municipalities in these countries and in the U.S.A., while ten societies in the British Colonies sent delegates, as did also the municipality of Montreal. The name of the O.A.A. was conspicuous by its absence from this list. It struck some of us as being a little odd that out of all the delegates from the British Colonies no one was named to reply to the address of welcome at the Guildhall, nor to the toast of "The Foreign Delegates" at the banquet. Perhaps this should be taken as a delicate compliment designed to make these Colonial delegates feel at home by the implication that "we're a' John Tamson's bairns," and so not to be treated as strangers.

Such a Congress as this is probably more valuable from a social than an educational point of view in that it affords architects opportunities of becoming personally acquainted with their brethren of other countries. The reading and discussion of papers must necessarily be somewhat perfunctory amid so much hurry and bustle, and the discussions are sometimes difficult to follow, owing to different languages being spoken. One cannot but notice how usual it is for professional men on the Continent to speak fluently, besides their own language, at least one or two others of which English is usually one. Many of the foreign delegates spoke in excellent English. In this matter English-speaking people are far behind. But fortunately Latin and Greek are not now the fetishes they used to be. It was encouraging to meet the other day a well educated Canadian youth who knew no Latin, but did know French and German. The papers were of the kind usually read at such meetings. New and striking ideas are not to be expected there. It is not surprising that some of the resolutions passed on the questions discussed were rather colourless, if not inept, e.g., that in regard to educating the architect as a craftsman. That referring to the preservation of ancient monuments was good and advocated necessary repairs as opposed to restoration.

It was noticeable that of the buildings visited solely for their architecture, only two were contemporary work. Probably all the members would be familiar from photographs and books with the monuments of ancient architectural art which were visited. But in seeing the actual buildings with the scenery and surroundings in which they are set, one gets a truer impression of them than any photograph can give. The mind is carried back to the times when they were built and can realize how expressive a living art is of the character of the men who wrought in it and the conditions under which such results were produced. The lion oak in the park at Hatfield was pointed out by Colonel Balfour, who did the honours there, as having been mentioned as a landmark in Domesday book. If that venerable oak could only speak! The pity is that modern electicism produces so few works that can be shown to visitors as being worthy to be ranked with those of the past.

The exhibition of architectural drawings and pictures was so good and so well arranged that one wishes it could be made permanent. The attentions shown to visiting members maintained the traditions of British hospitality, and some great houses inaccessible to ordinary visitors were opened to them. The banquet which closed the proceedings was an unqualified success and was attended by some 500 ladies and gentlemen. For the first time, ladies had an official status by being given the opportunity to become members, and were thus enabled to take part in all the Congress proceedings as a matter of right. This added much to the brilliance of the banquet in particular. Many of the foreign as well as the British members were accompanied by their wives, and many different types were there from the fair Saxon of the North to the dark-hued daughter of the Sunny South. The President of the R.I.B.A. made an admirable chairman, and the speaking was good and to the point. Altogether it was a fitting and happy conclusion to the Congress.

ILLUMINATION OF A WAREHOUSE.

By Ernest C. Smith, M. E.*

There are buildings for many lines of business in which the theory most commonly applied to the lighting installation is that the men experienced in these respective lines know best "where they want the lights." If this were naturally true it would leave much gross misuse of the means of illumination to be accounted for. It is also much more commonly believed that close calculation and the use of highly efficient accessories for the class of lighting installation with which we have to deal in this number is extravagance. It is fortunately possible to make rather close comparisons between different methods of lighting where efficiency is of prime importance.

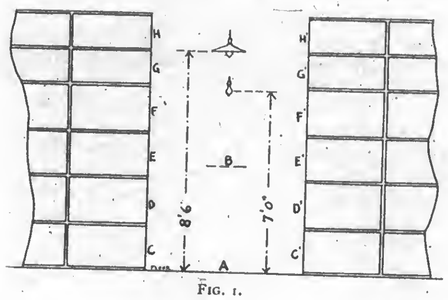


Fig. 1.

The problem in hand is the lighting of a wholesale warehouse, the stock carried being hardware and cutlery. The building in question is 133 ft. front by 130 ft. deep, four stories and basement. All of these floors are used for stock except the ground floor one-third of which is used for offices and the balance for shipping and receiving. Inasmuch as a complete description of this installation would entail much repetition and some very obvious information I have decided to simply illustrate the application of illuminating engineering to a problem of this sort without any attempt to rehearse the schedule of equipment actually used.

Fig 1. is a sectional view of the shelving on either side of one of the second floor aisles 43 ft. in length, with a window at one end and the main aisle at the other. The points taken for the calculation of illumination will be floor A, the plane in which orders and shipping memoranda would ordinarily be read B, and the centre of the space above the various shelves C, D, E, F, G, and H.

The illumination is measured in terms of the strength of the incident rays and the distance of the object from the radiant source. Where light is measured in "candle power" and distance in feet, the common unit of illumination is a foot-candle, i.e., the illumination on a plane perpendicular to the rays at one foot distance from a light source of one candle power. For all light sources of relatively small size the law of inverse squares applies very closely to the direct illumination, that is to say, the illumination varies inversely as the square of the distance from the source. If the plane of illumination is not perpendicular to the rays the result of this calculation must be further multiplied by the cosine of the incident angle.

*Engineering of Illumination, Atkins Building, Winnipeg.

For the conditions illustrated in Fig. 1 we will first consider the use of an ordinary 16 C.P. incandescent electric lamp with clear bulb hung in the middle of the aisle and 7 ft. from the floor. On consulting the Uniform Illumination Curve of this lamp the following intensities of direct illumination will be found at the various stations:

A—0.12 foot-candles.
B—0.75 " "
C—0.18 " "
D—0.35 " "
E—0.75 " "
F—1.75 " "
G—1.75 " "
H—1.0 " "

If four of these lamps were placed at equal distances, that is, about 10 ft. apart along this aisle the minimum illumination in the plane B for reading purposes would be about 0.4 foot-candles, which is entirely insufficient. This method of lighting is open to the obvious criticism that the high intrinsic brilliancy of the lights materially reduces the apparent illumination of surrounding objects, with the lamps in this position.

We will next suppose the same 16 C.P. lamps to be swung 8½ ft. above the floor and fitted with flat porcelain cone reflectors. Referring again to the Uniform Illumination Curve of

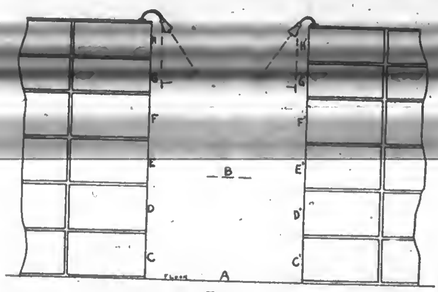


Fig. 2.

this unit the following intensities at the various stations are readily calculated:—

A—0.19 foot-candles.
B—0.75 " "
C—0.21 " "
D—0.36 " "
E—0.67 " "
F—1.2 " "
G—1.9 " "
H—0.75 " "

If placed 10 ft. apart as before the minimum illumination in the reading plane B would be 0.48 foot-candles, which is still insufficient, but would enable reference to orders, as the lights themselves are further out of the direct line of vision.

As a check on the difference in efficiency be-

tween reflectors we will consider these lamps in the same position but fitted with a form of prismatic glass reflector, having a diffusive coating of enamel. We will also assume that the tip halves of the bulbs are frosted in order to cut down the intrinsic brilliancy of the light sources within visible range. The uniform illumination curve of this unit shows somewhat better distribution below the horizontal and the following intensities at the several stations:

A—0.35 foot-candles.
B—1.2 " "
C—0.34 " "
D—0.5 " "
E—0.75 " "
F—1.6 " "
G—1.7 " "
H—0.8 " "

In this case the minimum illumination in the reading plane would be 0.5 foot-candles, which is not much greater than with the flat opal reflector. With the half frosted lamps, however, and the use of diffusing reflectors the apparent illumination is very much increased, in fact, the increased degree of comfort experienced with lights fitted as in this example would easily increase the visual effectiveness of the illumination twenty per cent. as compared with the preceding arrangement.

It is obvious that the lighting as shown will not go very far towards illuminating the innermost parts of the shelves. Neither is this necessary to be accomplished in any marked degree, but an improvement in this direction is of considerable benefit. We will therefore adopt an arrangement of lights as illustrated in Fig. 2, using small goose necks placed 8 ft. apart along the top of the shelving. We will suppose each of these to be equipped with an 8 C.P. clear bulb lamp and a prismatic glass reflector, having a card-board shade to prevent the accumulation of dust on the outside of the prisms. The reflector used in this case is one producing a considerable depth of curve and the lamps are pointed at an angle of 35 degrees from the vertical. We will now consider that for the lighting of each row of shelving only the lamps on the opposite side of the aisle are to be used. Proceeding similarly as above we have the following results:—

A—0.3 foot-candles.
B—1.15 " "
C—0.5 " "
D—0.7 " "
E—0.75 " "
F—0.7 " "
G—0.52 " "
H—0.45 " "

It will be observed that this illumination is much more uniform and that the average illumination on one side of the aisle is nearly as high as was obtained with the use of 16 C.P. lamps located as before described. It therefore seems probable that an arrangement of lights above the shelving, each row controlled by a switch at the end of the shelves on the opposite side of the aisle (i.e., the shelves to be lighted by the lamps controlled), would under the conditions of actual use result in much greater economy of current as well as provide better illumination.

The uniformity secured under this arrangement will be better understood on calculating the effect of neighboring lamps. Considering the section in Fig. 2 to be anywhere throughout the length of the aisle the following intensities are obtained without any allowance for diffuse reflection:—

	Maximum.	Minimum.
A	05.	0.4
B	1.45	0.9
C	0.68	0.4
D	0.9	0.55
E	0.93	0.53
F	0.9	0.4
G	0.66	0.5
H	0.57	0.5

About the same average illumination at the points taken for calculation would be produced with 16 C.P. lamps unshaded and spaced every 8 ft. along the aisle, but with much less uniformity and far less visual effectiveness. With the arrangement now arrived at it is not necessary to use frosted bulbs, as the lights are always above and behind the person working at any row of shelves. The illumination of the interior of the shelves is also improved.

What we have done so far, however, is only to improve the illumination. The cost of this must be considered.

We will assume that the switches will be placed conveniently so that one row of 8 C.P. lamps will be turned on the same length of time as would the row of 16 C.P. lamps in the first arrangement above described. The cost of equipment per the last description is $9.25 more than according to the first method. The consumption of power in the last case will be 160 watts as against 280 watts in the first case. With current at 8c per K.W. hour the saving effected during the life of the first installation of bulbs will be $19.20 plus $1.25 for renewals, when using only one row of lamps, or a total saving of $20.45. Deducting the extra first cost, we have a net saving of $11.20 during the life of the first installation of lamps. A liberal allowance for maintenance would not reduce this saving below $10.00. In the building under consideration there are some 3,600 ft. in length of aisle, with shelving on both sides, so that corresponding economy throughout the building means a net saving of $830.00 before the first set of lamps is discarded. Figuring the cost for renewals and 20 per cent. for breakage of reflectors and with the same liberal allowance for maintenance, the saving while the second lot of bulbs is in use will amount to $1,286.00. This does not take into consideration the lighting of offices and shipping department.

In this warehouse there are some thirty different arrangements of shelving and in some cases the requirements were such that some modification of the arrangement shown in Fig 2 was necessary. Throughout, however, the same principles were applied that have been illustrated and in many cases a more marked improvement in the illumination has been effected than under the particular conditions chosen for an illustration of average requirements. Of course it is essential that the actual voltage be tested and that good lamps of the proper duty be purchased for the available voltage in order that the full benefits of such calculations as above described may be realized.

MONTREAL NOTES.

There is from time to time talk of a new bridge which is to span the river opposite the city. Just at what point has not, we believe, ever been precisely defined—perhaps because not definitely known, perhaps for prudent financial reasons. It has recently been announced, however, that preliminary operations are now well under way and various particulars have been published in daily papers. This project if it is to be immediately carried into effect as announced—for it is said that two years will see the completion of the work—must materially affect the aspect of the city. An integral part of the project is to be a railway station and hotel, for it is expected that the Delaware & Hudson and other railway lines on the south shore will obtain running powers over the new bridge. The promoters are the Montreal Bridge and Terminal Company, and it is expected that the tolls levied will in time pay for the erection of the work. The actual bridge is to be of cantilever principle, with a main span of 1,500 feet and clear headway of 150 feet. It will consist of two roadways at different levels—the lower for trolley and general traffic, the upper for railroad business. It must therefore practically pass over the down town portion of the town plying across St. Paul, Notre Dame, St. James, and Craig Streets and joining the up town traffic about St. Catherine Street, probably not very far from Bleury Street. The upper line will have to travel some distance farther inland before striking terra firma. The designer is Sir Douglas Fox, who designed the bridge over the Victoria Falls, on the Zambesi River. The cost spoken of is $12,000,000, the capital being raised in England.

It has already been remarked in these notes that as in London, England, enterprising people dream garden cities where the men of the future shall live in health amid the beauties of nature, so in Montreal aspiring minds dream grand hotels and apartment houses. In both cases, of course, a number of the schemes come in time to fruition. One of the most recently announced projects of this nature is the formation of the St. James Realty Company to erect and operate a great down town hotel. The eastern portion of St. James Street and Victoria Square are mentioned as probable sites.

Last month it was noted how many yawning chasms appeared in all the principal streets of the city. This month from these pits have been growing great crops of tall steel stanchions and framing—a sort of forests which resound with the deafening "purr" of the rivetters. Another ten-storey building, that for the Canadian Express Company, is preparing for McGill Street.

Whilst a good deal is being done to abate the telephone pole nuisance another forcible argument against them has asserted itself. On one day—the 29th of July—two street car conductors were killed while collecting fares on the step of their cars by being dashed against these cumberers of the ground. Considering the great rapidity with which during the past few months the motor car has been coming into vogue one might almost be permitted to hope that the trolley car with their horrible and dangerous overhead wires may themselves be superseded before very long, and then at last we shall have a chance to see what the architecture of the city is really like.

We publish a view of the new Cremazie monument in St. Louis Square, which was mentioned last month. Application has been made to have

MONUMENT TO OCTAVE CREMAZIE, ST. LOUIS SQUARE, MONTREAL.

a railing put round this—not in itself a desirable object, but apparently necessitated by the disrespect of the local small boy, who insists on making the soldier's cocked hat a receptacle for dirt and rubbish! Children have also a fancy for scrambling over the poor old fellow and sitting on his knee, which seems not so unnatural or harmful.

THE P. Q. A. A. SKETCHING CLUB.

On Saturday, July 14th, the Sketching Club visited the ancient town of Chambly, which has been in existence since 1665. Besides the well known fort there exists quite a number of old stone houses, amongst which are some of typical colonial character, others are more thoroughly Canadian. The De Salaberry house has a verandah with quaint Doric pillars. The little old Protestant church has a colonial porch and a twinkling tin-scaled belfry which has quite a charm. At Chambly Canton the woolen mill is a picturesque group of buildings, the old rubble of which is full of delightful colour.

On August 4th the visit was to the new Commercial and Technical High School, which the Protestant School Commissioners are building on Sherbrooke Street. Class rooms are provided for the teaching of drawing, chemistry and physics, cooking, sewing and other subjects. There is a large assembly hall and gymnasium in the

rear and play rooms for boys and girls in the basement. All the rooms are excellently lighted and amply provided with lavatory and cloak accommodation. The floors are of Oregon pine and

OLD STONE HOUSE, CHAMBLY CANTON, P. Q.

of Terazzo. The woodwork generally is of chestnut, and the central corridor eleven feet wide on each floor has a high dado of chestnut. Mr. A. F. Dunlop is the architect in charge of the work, and it was by his permission the visit was made.

PROTESTANT CHURCH, CHAMBLY, P. Q.

After looking over the school, members of the Club went over the works at the Nurses Home of the Royal Victoria Hospital, by permission of the architects, Messrs. Ed. and W. S. Maxwell. The buildings are of rubble stonework with dressings. The floors are supported on terra cotta arches of very wide span.

SOME RECENT BUILDING PERMITS IN MONTREAL.

Store for Henry Birks, corner of Phillip's Square and Cathcart Street; 90.0 front, 146 ft. in rear, 76 ft. deep; in five stories faced with sandstone; gravel roof. Probable cost, $150,000. Contractors, Heggie & Stewart. Architects, Hutchison & Wood.

Three stores for Mrs. J. C. McIntyre, in Craig Street, near Victoria Square; in stone and brick; seven stories high with gravel roof; 142 ft. front, 125 ft. in rear, 135 ft. deep. Probable cost, $143,000. Contractors, Peter Lyall & Sons. Architects, Hutchison & Wood.

Alterations to the property of La Banque Provinciale, No. 9 Place d'Armes. Probable cost, $45,000. Contractors, O. Martineau & Son. Architects, Huot & Payette.

Cold storage warehouse in Queen Street, near William Street, 36 ft. x 97 ft., in five stories of pressed prick, for Lavell & Christmas Ltd.

WOOLEN MILL AT CHAMBLY CANTON, P. Q.

Probable cost, $36,000. Contractors, Heggie & Stewart. Architect, W. E. Doran.

A four-storey warehouse, No. 614 St. Paul Street, for T. S. Vipond & Co.; brick with cement and gravel roof. Probable cost $12,000. Contractor, Geo. Nicholson. Architects, Macvicar & Heriot.

A four-storey warehouse, 37a to 37c St. Anthony Street, for the Kemp Manufacturing Co.; to cost about $30,000; pressed brick with resin and cement roof. Contractor, Thos. Wand. Architects, Macvicar & Heriot.

Alterations to building for W. R. Brock, corner of Notre Dame St. and St. Helen St. Probable cost, $30,000. Contractors, Heggie & Stewart. Architects, Cox & Amos.

House for J. J. M. Pangman, Ontario Avenue, near Sherbrooke Street; pressed brick, asphalt and gravel roof. Probable cost, $20,000. Contractor, James Young. Architects, Findlay & McGregor.

House for M. B. Davies, Pine Avenue, corner of Peel Street; stone and brick, concrete roof. Probable cost, $75,000; also stable to cost about $8,000. Contractors, Dominion Engineering and Construction Co. Architects, Findlay & McGregor.

Two houses in Sherbrooke Street, corner of Mackay Street, for Mrs. M. A. Weir; stone and brick. To cost about $25,000. Contractors, Rhéaume & Perrot. Architects, Huot & Payette.

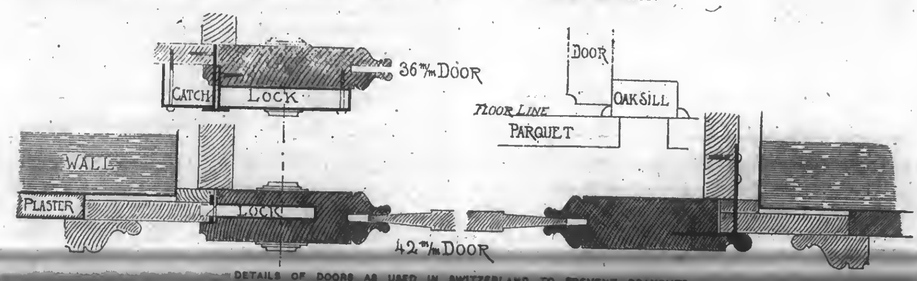
Alterations to a church for l'Oeuvre et Fabrique d'Hochelaga, in Ontario Street, near Désery Street. Probable cost, $39,500. Contractor, M. Huberdeau. Architect, Jos. Venne.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Edmonton"—I have been informed that in some of the countries of Europe, doors and door-frames are often made so that when the door is closed all the joints are covered because of the stiles and rails of the doors being rebated over the door jambs, thus cutting off all drafts and currents of cold air. Will you kindly describe how this is done and oblige an old reader?

Ans.—This "Lapping of the joints," as it is called, is practiced in Sweden and Denmark and some other of the northern countries and is not unknown in England and Scotland, but is more in use in Switzerland than elsewhere. The illustrations shown herewith give all the details of the method of fixing the doors most in use in Switzerland. In designing a building in that country a sample door is made for every building—and completed; the frames are then made to suit the door. You would probably find some difficulty in finding locks and hinges to fit doors of this kind. We do not see of much being gained by using doors of this kind. If the doors are well made, well fitted and well hung in



DETAILS OF DOORS AS USED IN SWITZERLAND TO PREVENT DRAUGHTS.

our good Canadian style, they ought to be as nearly draft-proof as it is possible to make them.

From "London"—as a Roofer, I would like to know how soon a tin roof should be painted—if painted at all—after it is finished.

Ans—A large manufacturing firm in the U.S. a short time ago, sent out a circular letter to roofers, builders and others, asking very nearly the same question. We publish the questions and replies which were considered the best, and from which our correspondent may draw his own conclusions.

"The first question, How soon after a roof is covered with best roofing tin do you think it should be painted? brought out quite a difference of opinion.

Manufacturers practically agreed in their answers, which advised that roofs be painted immediately or as soon as possible after being laid.

The architects showed a considerable difference in opinion. Below are given some of their replies:

"After first rain."
"After tin loses greasy surface."
"Before it shows any sign of rust."
"From four to six weeks."
"Soon as possible after laying."
"Four weeks."
"When the oil is off and just before rusting begins"
"After not more than one or two rains. Certainly before it begins to rust."
"Immediately after put on."
"Within two weeks."
"It depends upon where the tin is located; 30 to 90 days."
"The sooner the better."
"At once."
"Immediately after putting on."
"After first good rain."
"Just before the tin wears off."

The tinsmiths and roofers also show a wide difference of opinion. A few replies are as follows—

"Paint immediately."
"Three weeks."
"After six, months."
"Soon as possible."
"At once."
"After two or three rains."
"Immediately."
"Three of four days."
"Soon as possible."
"One night; sooner the better."
"After second rain."
"Two weeks."
"After first rain."
"Painted at once."
"Sooner the better."
"Two weeks."
"Nine days."
"Quicker the better."
"When it begins to rust."
"Soon as it shows sign of rust."
"Four weeks."
"After first rain."
"Immediately."
"One year."
"Immediately."
"After one wetting."
"Four or five weeks."

THE SECOND QUESTION.

Would you care to guarantee a roof it were not painted?

To this the manufacturers agree in the answer "No," stanting that the best roofing tin in any climate needs paint as an additional protection. The architects make the same reply.

Most of the tinners state that they will not guarantee an unpainted tin roof, although a few are willing to do so for the lengths of time below stated, which, it will be noticed, vary greatly:—

"Six months." "Four or five weeks." "One year." "Five years." "Five to seven years." "Not longer than one year." "Three years." "Five

years." "One year if not painted" "will guarantee a roof five years if not painted."

THE THIRD QUESTION.

Manufacturers and architects agree absolutely in making the reply of "certainly not" to the third question, would you care to guarantee a roof if it were not painted and if part of it were under water?

The tinners and roofers in nearly all cases say "No". Some of the other answers are of interest, as they show a vast variance in opinion."

"After getting a large number of answers the firm came to the following conclustions—

1st—Any roof covered with roofing tin should be painted immediately after the roof is covered.

2nd and 3rd—No manufacturer will guarantee roofing tin if it is not painted at once after the roof is covered, as the best roofing tin in any climate needs paint as an additional protection."

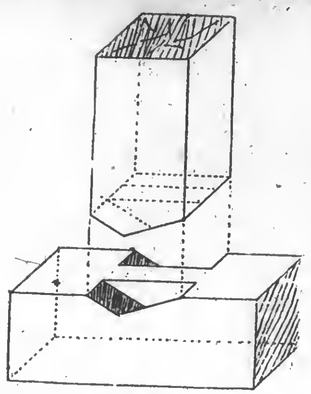


FIG. 1.

From "Wants to Know"—Kindly explain the objects of "filling" in wood and in plaster, and the method and materials used?

ANS.—There is a broad distinction between the filling for woodwork or plaster walls and that used for wood work which has to be left in its natural color and be finished by varnish or stained and varnished; but the object is the same in either case. It is done to bring the work up to a level non-absorbent surface. As this is the case, filling is sometimes called surfacing, but woodwork is not always filled. Pitch pine is sometimes varnished direct without filling, and without size. When this is done two coats are used. To the first coat a little black japanners is added, according to the depth of color desired. This tints the varnnish to an agreeable tone. The japanners setting quickly preventing any great absorption of the varnish by the grain or pores of the wood.

The filling for surfaces of either wood or plaster to be afterwards painted requires to be composed of materials which rapidly become hard and can be quickly cut down to a level surface (either by means of a flat cork covered with glasspaper or by pumice stone and water), filling up all depressions. On the other hand, the filling for wood to be stained or left in its natural color and be varnished needs to possess other qualities. In this case it is necessary that the filling should be transparent, and also be exactly the color of the wood, so that the filling does not contrast with the brightness or color of the wood itself, to which it is applied. A transparent mineral base is the ideal filling, this material being bound with varnish. The object aimed at in its use is to fill up the grain, to stop cracks nail-holes and bad places and to prevent the varnish from sinking in—to form a surface for the varnish in fact.

In practice various ingredients are used for filling painted work, mixtures with or substitutes for white lead, which of itself does not readily dry hard enough to rub. It is also expensive. A mixture in general use consists of yellow ochre, vegetable black and white lead in equal proportions, mixed with japanner's goldsize, but this would only do for dark colored work. The ochre too is inclined to be gritty and does not easily mix with the other ingredients. If ochre is ever used it should be ground in a mill; it never rubs up satisfactorily with a palette knife. Equal parts of vegetable black and white lead bound with goldsize and thinned with turpentine also form a good filling, but this will only do for dark colors. Two-thirds sifted pumice stone dust added to tub lead, bound with quick drying rubbing varnish makes readily a good surface, cutting down easily with pumice stone and water and suiting light colors.

There are many fillers in the market of Canadian manufacture which may be obtained from any dealer in oils and paints. They may be obtained already colored to suit the work in hand. Directions for using are pasted on the tin can containing the filler.

From "Framer"—Will you kindly set me right as to what is a bridle joint, both oblique and upright?

ANS.—A bridle joint is known in carpentry as a joint having a tenon in the position where a mortise usually is located in ordinary framing. Fig. 1 shows a bridle joint where the timbers are framed at right angles to each other. It will be seen that the upright timber is so cut that the two flaps of the mortise "straddle" the tenon. The shape of the "butt" of the timber does not matter, it might have a square joint for the butt, and be just as strong. Fig. 2 shows an oblique "bridle" with the timber so shaped that it forms a solid foot to resist the thrust angle timber. These joints are used in many cases of roof and bridge construction.

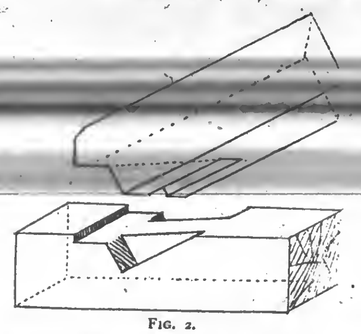


FIG. 2.

Messrs. Nicholson & Beckel have opened a new brick yard at Estwan, Sask., the machinery being now on the ground, and expect to have brick on the market shortly.

Another new industry has been started in Medicine Hat by Messrs. Schram & Brown who have commenced the manufacture of cement brick by a patent process which they control for Alberta.

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS.

The National Association of Master Plumbers Steam, Gas and Hot Water Fitters, of Canada held its Seventh Annual Convention in Ottawa on August, 9th.

The following is the Presidents' Report, presented by Mr. A. J. Hammond the late President:

WINNIPEG, July 30th, 1906.

To the National Association of Master Plumbers, Steam, Gas, and Hot Water Fitters of Canada.

GENTLEMEN,—I take it as a pleasure to submit my report to the Eleventh Annual Convention of the National Association.

On looking through the work of the past year it gives me cause to be gratified for the estimable way in which the business of the Association has been carried through, and the most considerate help derived from the co-operation of the various officers of the Association.

It may interest the Association to know that I have received and replied to something like seventy letters during my term of office. It has always been my endeavor to reply to any queries submitted to me for approval and appertaining to the general interests of the Association.

I feel proud of the work that has been accomplished and I am sure the Association will agree with me when I say that our efforts have not been fruitless and that a large amount of good has resulted thereby. My personal views are that the complication in the trade goes to prove that organization is the only visible means to save us from the evils now existing and arising partly from the uninformed and from the misrepresentations reported in the press.

I am quite certain the day is not far distant when the Master Plumbers, one in all, will have to band together for the protection of their interests and the sooner we awaken up to these facts so much the better.

It can be clearly seen that the only way to avoid a repetition of the past events and to alleviate our burden, is to be more thorough in organization on a sound basis. This is the only remedy from which we can derive any satisfaction and it is our bounden duty to up-hold any measures put forth from any individual member that will further tend to strengthen the work which we have before us.

At the close of Convention last year in accord with the recomendation that sub-Executive be appointed in one city, Messrs. Ryan and Hughes were appointed to act in conjunction with Mr. J. A. Gordon as sub-executive for the current year.

One of the first matters undertaken was the printing of annual report, which was somewhat delayed on account of said report being lost through the mail and thereby necessitating another copy being written and these did not reach the Executive until the later part of December.

I would therefore recommend in future that when the minutes are to be mailed to secretary the handling of these be left to someone resident in the city where the convention is being held, thereby ensuring prompt delivery to secretary and not left entirely to stenographers.

The usual grant was made to Mr. J. A. Gordon for previous year, also grants to Provincial vice-president, including Ontario V. P. which was passed by Executive.

Mr. J. A. Gordon and Mr. P. Ogilvie attended semi-annual Convention of Ontario at Toronto in October last and were well received. At this Convention a committee was appointed to meet a committee of the N. A. M. P. of U. S. A. to talk over certain mutual concessions, this same committee to report on all benefits to be derived therefrom. Mr. Mahony will most likely satisfy us on this point.

I am sure we were all sorry to hear of the late disaster at San Francisco, and hope that the M. P. of Canada made a hearty response to the request through the Journal for subscriptions towards the relief fund towards Master Plumbers there. A request was made for our Association to subscribe the sum of $50, and I anticipate this was forwarded in due course.

I am desirous of bringing before the members of this Convention a matter that has been somewhat prominent in my mind of late, namely, that of Incorporation. My opinion is that if our Association were incorporated we would not as individual members have the sole responsibility on our own shoulders and in case of any legal expenses being incurred at any future date they would be borne by the Association as a whole. I am inclined to think that it would place the Association on a stronger footing, and put us in a position to overcome any further obstacles that may threaten us. This I recommend to the Association for careful consideration and discussion.

I would also recommend that we prepare a 'Dominion Directory' of members of the N.A.M.P., also a list of manufacturers and jobbers in accord—this list to be revised from time to time. This recommendation I am well aware was left in the hands of the in-coming executive last year but this remains in statu quo. This gives us further proof of the necessity of a permanent secretary which I regret to say we have up to the present been unable to procure, for what reason I need hardly explain.

During my term of office I have kept in touch with the various local associations within my reach and have thus in a sense, obtained a bird's eye view of the work being done and consider-

The Standard Ideal Sanitary Company, Limited

MANUFACTURERS OF

Porcelain Enamelled Cast Iron Baths, Lavatories, Sinks, Etc. . .

REPUTATION As manufacturers of an UNEQUALLED QULITY of Cast Iron Porcelain Enamelled Ware is but the combination of good, honest, first-class workmanship, material and experience given to our customers as promised

JUSTIFIES the REPUTATION our line of WARE now enjoys upon the Canadian market.

Factories and Head Office: PORT HOPE, ONT.

ing the difficulties we have had to contend with. I am gratified to see that we are still holding our own. This has been nevertheless, what I might term an up-hill fight, but I am sure the reverses we have undergone will eventually increase the ranks of our Association and that we will go forth with renewed vigour and determination, come what may, to take our stand for the promotion of our interests.

Nova Scotia has no provincial association, but I am pleased to say that there is a local association in the City of Halifax and which is very complimentary to them.

New Brunswick I find is in rather a more disorganized state, but trust to hear in the near future of some further developments towards organization.

Quebec—In Montreal the conditions are more satisfactory, the Association being pretty well intact and increasing in membership. It appears to me to be the main-stay of the province, and I am looking forward for excellent results from this quarter.

Toronto has organized some fifty members, and hope by this time that she has increased her membership to such an extent that will be pleasing to all, also that Ontario has taken her place at the top of the ladder again.

Alberta and Provinces of B. C.—I am not in a position to make any report thereon as I had no reply to my last inquiry but trust those Provinces will make their own report which should be satisfactory.

Manitoba—Portage la Prairie and other towns throughout the province, I find organization at present out of of the question as the plumbing business is as yet in its infancy; therefore they have no local association.

In my own city we are in much the same shape as when you left us, with a scarcely any prospect whatever of organization.

We are, at the time of writing, in the midst of a strike and we are directing operations through the medium of the Builders' Exchange of which about twenty Master Plumbers are members. Their grievance (the men's) was one what we could not see our way clear to accept. They presented their new schedule on the 30th of June with no alternative but for us to sign this on July 3rd or an immediate strike would ensue. A meeting of the Master Plumbers of this city was held July 2nd and it was decided not to accept their schedule in its present form and we notified them to this effect, but as there was no reply from the union they discontinued work July 3rd.

Up to the present there is little prospect of a settlement as every day we are gaining ground and hope to be finaly masters of the situation. The men up to the time of the strike were receiving a minimum of 35 cents and a maximum of 50 cents per hour. The new schedule called for 40 cents to 52½ cents per hour but it was not so much the extra wage we objected to as the most stringent measures they wanted to enforce in their new schedule.

At the last convention I had the honour of being appointed a delegate to the M. P's Association of U. S., but as I had this present strike in view and also our convention so close at hand I was reluctantly compelled to decline the proffered visit, but was fortunate in securing a representative in the person of our secretary Mr. J. A. Gordon. Mr. Mahoney also attended the convention, so there is no doubt in my mind that their report to this convention will be of benefit and that the Association was well represented.

I took the liberty of mailing Mr. C. J. Boyd, president of the N. A. M. P. of U. S., the following letters of M. P. A. of Canada: To Mr. C. J. Boyd, president N. A. M. P. of U. S., Atlantic City.

To the members of N. A. M. P.

GENTLEMAN,—On behalf of the Master Plumbers' Association of Canada I beg respectfully to tender their compliments to your Association.

I very much regret that in person I cannot be at the Convention though in spirit I shall be with you. However, I am sure it is the wish of each individual member of the Association throughout Canada that the meeting be a progressive one and that it will be the means of further extending the interests of the N. A. M. P. to U. S. A.

Wishing for the prosperity and success of your Association, I am,

Yours respectfully,

A. J. HAMMOND,
President N. A. M. P. of Canada.

This concludes my report for the year 1905-06.

I thank you for the several honors conferred upon me, which I have tried to fulfill to the best advantage. It has been my sole aim on all occasions to promote the interests of the Association as a whole, which I hope has not been in vain nor without some beneficial results.

I wish to express to you my thanks for the way in which you have borne with me whilst I have endeavored briefly to expound the work of the Association and its praiseworthy objects. I hope the 11th annual convention will be a record gathering, and that all business conducted at these meetings will be brought to a successful issue.

Finally, let us all unite in one desire to further advance the craft throughout the Dominion of Canada.

Again thanking you all for your kind attention, and wishing you all prosperity in business, I am,

Yours very truly,

A. J. HAMMOND,
President.

The Officers for the coming years were elected as follows: President, F. G. Johnson, Esq., of Ottawa; Past President, A. J. Hammond, of Winnipeg; Vice-President, John Watson of Montreal; Secretary, John A. Gordon. Esq., Montreal; Treasurer, H. Mahoney, Esq., Guelph; Provincial, Vice-President for Nova, Scotia, G. A. Wootin, Halifax; for New Brunswick, D. Shea, Fredericton; for Ontario, B. Noble, London; for Manitoba, C. A. Gate, Winnipeg; for British Columbia, Bert Weeks, Vancouver; for Quebec, Jos. Lamarche, Montreal; for Athabaska and Saskatchewan, E. J. Young, Calgary. Chairman of Committee—Hugh Wallace; Hamilton; Sanitory Committee, S. H. Knox of Ottawa; Essay Committee, A. J. Hammond of Winnipeg.

PROVINCIAL BUILDERS' EXCHANGE.

LONDON, August 6th, 1906.

THE CANADIAN ARCHITECT AND BUILDER.

GENTLEMEN,—In acknowledgement of your favor of July 26th, regarding the matter of a Provincial Builders' Exchange, must say that I am heartily in accord with the formation of such an association, and hope through the medium of your publication that you will awake the contractors and builders of Ontario to the fact, that it is essential that a Provincial Builders' Exchange be organized at the earliest opportunity. You may ask, "why is it necessary to have a Central Exchange when almost every City has a Local Exchange?" In answer to that, I may say, that the Local Exchange may handle questions affecting the trade in the city or town where they are located. But there are problems, which affect the public, as well as the contractor, and these require the united efforts of all the exchanges consolidated in one Central Association. I believe that such a Provincial Association, taking in all the Local Exchanges, is most essential to carry on a successful issue, as affecting the interest of the contractor, and the public in general. There are so many issues affected by organized trade unions, and the unfair methods used by organized labor to attain their aims, that the contractor must of necessity organize.

Then again, there are certain laws on the Statute Books of this Province which require amending, and if we had a Provincial Exchange, we could bring more influence to bear upon the Legislative Assembly, and have them so amended, that they could be of some benefit to the contractor. The leaders of organized labor always have some representative to look after their interests at all the sessions of the Provincial Assembly, and if they find it beneficial, why would it not pay the builders to have some one to represent them and look after their interests, which could be easily accomplished if we had a central associatiod. There are also a great many other issues which would be a benefit to the contractor and builder, but I will leave them to older heads than mine to pronounce upon.

GEO. C. YOUNG,
President London Builders' Exchange.

The Canada Gazette announces the incorporation of "Desmarteau Plumbers Supply Company" (Limited), with a total capital stock of $195,000, and the chief place of business to be Montreal, Que. The company are to acquire and take over the business and trade of plumbers' supplies and woodenware now carried on in the City of Montreal and elsewhere by the firm "J. A. Desmarteau." The promoters are Messrs. Joseph A. Desmarteau, Henri Herbert, Pierre Bilaudeau, Hormisdas Hamel, all of Montreal, and Jean B. Roberi, Ste. Scholastique.

Although United States cities have been complaining that the San Francisco disaster has caused a cement famine, Canadian cities and particularly Winnipeg, will not suffer. Throughout the States cement has gone up 35 cents a barrel and the expectation is that it will continue to rise in price. Winnipeg gets all her cement from Ontario, particularly from the vicinity of Owen Sound. Rather than an increase in prices there is a steady and appreciable diminution as new firms get into the field. The trade in cement has increased with amazing speed in Winnipeg in the past ten years. In 1896 500 barrels supplied the demand in the entire northwest. Last year it took 125,000 barrels to satisfy Winnipeg alone. So long, say the dealers, as the marl lakes in the neighborhood of Owen Sound last there is little fear of a famine.

WROUGHT IRON FENCE

Make a Neat Appearance, Form a Perfect Protection and will last a Life Time

Designs from $1.00 a foot upwards. Send for Bulletin No. 23

CANADA FOUNDRY CO., Limited

Head Office and Works: TORONTO, ONT.

District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

ARCHITECTS!

SPECIFY

LUXFER WINDOW PRISMS

LUXFER SIDEWALK PRISMS

LUXFER FIREPROOF GLASS

Do not fear a little expense for good material.

It will pay you in the long run.

Your work is more satisfactory to your client and he is better pleased with what he has got.

Write us for prices or other information.

SPECIFY

MARBLE MOSAIC FLOORS

GLASS MOSAIC WALLS

ART GLASS

Luxfer Prism Company, Limited

100 King Street West, TORONTO

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:
ROOM E, 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2299.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 10th, and change of advertisements not later than the 5th day of the month.

EDITORIAL ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	JOHN E. BELCHER, Peterborough
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. E. VANIER, "
TREASURER	J. E. GARDINER, "

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—A. R. DECARY AND C. DUFORT.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.
THOS. W. SELF, 1st Vice-President.
C. W. BATT, 2nd Vice-President.
JAS. CRANG, Treasurer.
H. MARTIN.
THOS. CHRISTIE.
J. R. HOIDGE.
JOHN ALDRIDGE.
JOHN MALONEY.

Exhibition Board—RICHARD O. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.
JNO. WHITTAKER, 1st Vice-President.
GEO. HYATT, 2nd Vice-President.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.
J. JONES.
CHAS. GOULD.
T. WRIGHT.
H. STRATFOLD.
A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.
R. A. CARTER, Secretary.
H. A. BELL, Treasurer.
T. BRADLEY
C. P. SHINDLER
K. M. FRASER
E. O. BAYNE
D. SAULY

WINNIPEG BUILDERS' EXCHANGE.

A. T. DAVIDSON, President.
J. W. MORLEY, 1st Vice-President.
T. E. DEACON, 2nd Vice-President.
A. E. PORTER, Secretary.
T. D. ROBINSON, Treasurer.
Directors: Thos Black, Jos. Bourgeault, E. Case, D. Cameron, V. L. Bouch, Wm. Alsip, Ald. J. G. Latimer, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. P. Alsip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.
JOS. O. DESLAURIERS, Vice-President.
J. HERBERT LAUER, Secretary.
N. T. GAGNON, Past President.
W. E. RAMSAY.
W. B. SHAW.
J. LEFEBVRE.
JOHN DUTHIE.
JOHN L. HARRINGTON
JOHN GRAY.
ALEX. BREMNER.
J. N. ARCAND.
JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN — Chairman
R. W. WHITTINGTON — Secretary
THOS. CATTERALL — Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.
G. MENARD, 1st Vice-President.
T. CHARPENTIER, JR., 2nd Vice-President.
ALCIDE CHAUSSE Treasurer.
N. T. GAGNON, Secretary.
FELIX SAURAGEAU.
L. Z. MATHIEU.
H. CONTANT.
E. Z. COTE.
LOUIS PAYETTE.

REGINA ARCHITECTURAL CLUB.

The architects of Regina, Alta., have recently formed a club, having for its object the advancement of the architectural profession and the bringing before the public the many and varied advantages to be derived therefrom which are not fully recognized in a new and growing country. The following officers have been elected: President, Mr. W. W. Hilton; vice-president, Mr. F. Chapman Clemesha; secretary-treasurer, Mr. W. B. Van Egmond; committee: Messrs. J. H. Puntin, A. C. Barrett, Ernest E. Carver.

Architects practicing in the province, outside of Regina, will be invited to become associate members.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

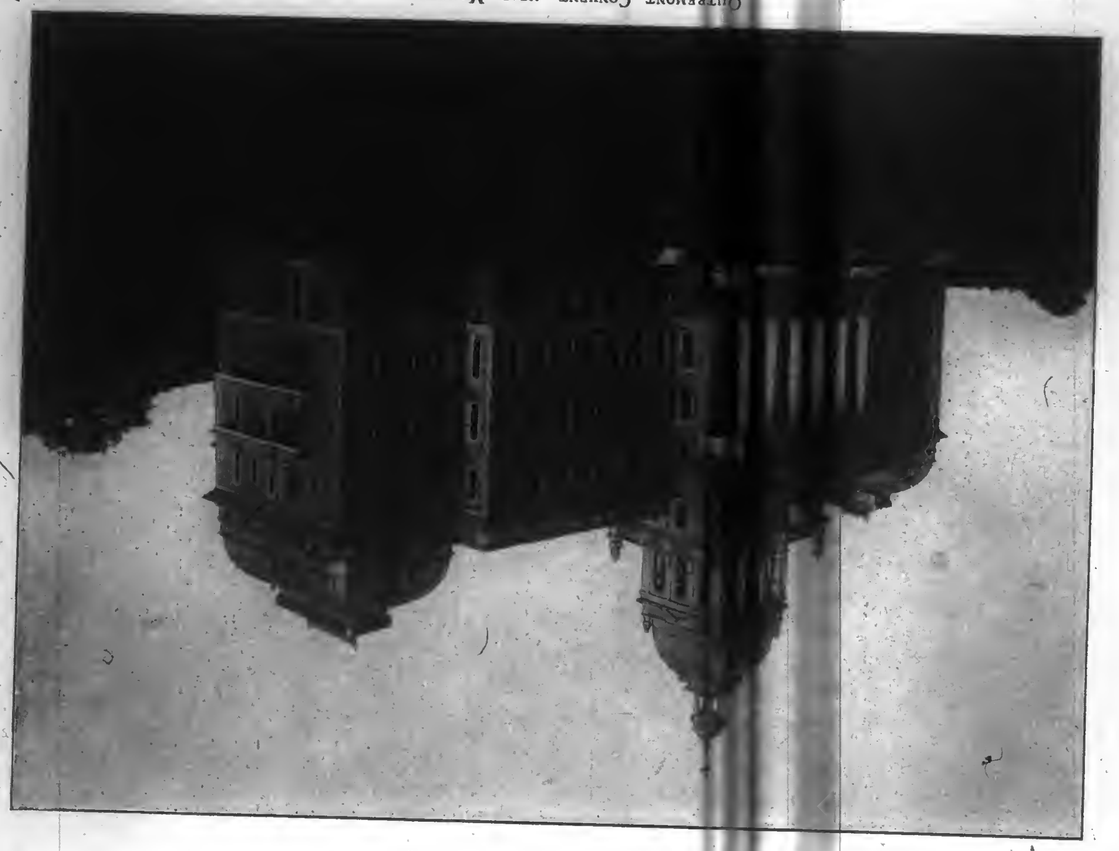
MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1906.

OUTREMONT CONVENT, NEAR MONTREAL.

Mr. J. Z. RESTHER, ARCHITECT, MONTREAL.



HOUSE FOR C. W. COLBY, ESQ.

PROF. P. E. NOBBS AND MR. D. R. BROWN, ARCHITECTS, MONTREAL.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1905

COTTAGE FOR E. RUTHERFORD, ESQ.

FROF. PERCY E. NOBBS, ARCHITECT, MONTREAL.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1905

PIAZZA DELLE ERBE, VERONA.

THE PALACE OF VERSAILLES.

FROM PHOTOGRAPHS BY MR. J. P. HODGINS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
AUGUST, 1906.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL. XIX.—NO. 225. SEPTEMBER, 1906.

ILLUSTRATIONS ON SHEETS.

House for Mr. Robert Wightman, B. A., Toronto; Messrs. Gordon and Helliwell, Architects, Toronto.
Cottage in Windermere, B. C., Professor Percy Nobbs, A. R. I. B. A. Architect, Montreal.
Oak Bay Hotel, Victoria, B. C.; Mr. F. M. Rattenbury, Architect, Victoria.
Canadian Pacific Railway Office; Victoria, B. C.; Mr. F. M. Rattenbury, Architect, Victoria.
Scenes in Venice, from Photographs by Mr. J. P. Hodgins, Toronto.

CONTENTS

Editorial	129-130	Intercommunication	138-139
The Toronto Exhibition	131	Freezing Method of Tunneling	140
Material Marks for Blue Prints	132	Canadian Architect and Builders' Competition	141
Our Illustrations	133	Utilization of Roof Space	142
Designs for Stables	134	Building on the Percentage Basis	143
Comparative Permanence of Building Stone	135	Personal	iv
Metallic Furniture	135	London Fair Exhibits	ix
P. Q. A. A. Sketch Club	136	Canada and Niagara Falls	x-xi
Montreal Notes	136	Holiday Outing of the Montreal Builders' Exhange	xii
Window Cleaning is Expensive	137	The Right to Photographs of Buildings	xiv

The Illumination of a Warehouse.

The valuable article on this subject in our August number by Mr. Ernest C. White, M. E., engineer of illumination, Aikins Building, Winnipeg, was by a printer's error attributed to Ernest C. Smith. We take the earliest opportunity of correcting this error as prominently as possible. The series of articles on the subject of il[illegible]

The Canadian Pavilion at Milan.

A cut of the Canadian Pavilion at the Milan Exposition, published in the Toronto Globe recently, is an admirable exposition of the agriculturality of Canada. It suggests that in the 'granary of the Empire' there is no time to waste upon art. If the Dominion Government would only build a first class barn, or a saw mill in all its purity of line, there would be something in it; but this pavilioned barn, with a saw mill roof, is neither one thing nor the other.' Among the buildings representing those other effete but cultured nations, it is to be feared, the Dominion building will appear rather like the ass in Aesop, who thought the way to get the same attention from his mistress as she gave her lap-dog was to frisk about her and bray and try to get on her lap. The ass ran against a stick. What we may run against one cannot say; but if the object of having a building is to create a pleasing impression in order to draw attention to our wares, this hay-seed architecture is not the thing to do it. The Globe, with unfailing patriotism, declares that, "as usual at all the international expositions the Canadian Pavilion will be the feature at Milan also." Perhaps the Globe is ironical and has a private interpretation for the word feature; reminding one of a short conversation between two friends, on the subject of a third who had at last got married—to worth rather than beauty. "I am glad," said the first friend, "that the old boy has got an object for his affection."—"Yes," replied the object."

A Building with Colour.

The idea of using glazed tiles or brick, to overcome the soot of London, is not new. It has been advocated for some years and practised, in spots and panels, now and then. But Mr. Halsey Ricardo, who received the society of Arts silver medal, about four years ago, for a paper on "The Architect's use of Enamelled Tiles", has put his ideas into practice by facing the walls of a whole house—a large unattached mansion in the Addison Road—with glazed brick coloured green and blue, dressed with a matt-glazed terra cotta of a light colour. The mass of the wall appears to be green; the blue is used in smaller quantities, for spandrels, etc. The roof is of glazed Spanish tiles of a bright green. Here is a building worth a visit from anyone going to London. We are sufficiently afflicted with smoke here to known that beauty of material must be counted out as a permanent feature of our design. Here is a material which will stay right if it is right. That is the question that makes us want to hear from some one who has seen the example. For practical reasons the glazed sur-

face is desirable; and it need not have all the shininess which we are accustomed to associate with glazed tiles. A street of highly coloured buildings might be a very nice thing. One would like to see the idea taken up and carried out thoroughly in some other town.

Every Man should have a Trade.

Apropos of the question of Trade Schools, it is worth noting that there has recently been a correspondence going on in the *Times* about the unemployed who make their annual demonstration in London. The idea is beginning to dawn upon those who interest themselves in the question that the trouble is not so much want of work as want of fitness for it; that the unemployed are the unemployable; and that they have become so by being made wage-carvers as boys without having learned a trade. The "little places" they fill provide only a little wage which soon becomes too small. "They want more, fail to get it, are replaced by other small boys, and seek more remunerative employment elsewhere. Being wholly unskilled, they find it very difficult to get employment, lounge about for a year or two as unemployed, and by-and-by in very many cases—as a result, of course, of environment—drift into the steadily growing ranks of the unemployable." This is no doubt a true account of the life of most of the unemployed. The waste and misery of it might all be prevented if it was the custom for every boy to learn a trade as part of his schooling. In England the customary committee of eminent gentlemen (with "valuable support" they say from the labour leaders) has been considering the question and will, before Parliament meets, submit a report offering suggestions "designed to encourage the spread of handicraft and widely extend the facilities for technical training." In this country, where our eminent gentlemen are all seeking further eminence in the stock market, we must pin our faith on the efforts of the Education departments to establish trade schools.

Mr. Leake's Report.

Owing to the necessity of a reorganization of the Technical High School in Toronto, a committee of the Board of Education was appointed to visit certain towns and cities in the Eastern States to make investigation into the question of the most suitable buildings and other matters connected with Technical Education. A report drawn up by Mr. Albert H. Leake, Inspector of Technical Education, gives an account of the information gathered by the committee, and by himself in a week's further tour after the committee had completed its work.

They visited schools in Springfield, Boston, Cambridge, New York, Brooklyn, Philadelphia and Williamston. The description of the work done accords with the statement in the report that "the tendency in the United States seems to be more and more in the direction of definite trade teaching." We find throughout the report curriculums comprising such subjects as drawing, carpentry, joinery, wood carving and turning, pattern making, forging of iron and steel, and machinists work with hand and machine tools. In combination with the manual work there is academic work which includes English, history, physics, mathematics, and in some cases French, German and Spanish. The summary of this part of its curriculum by the Central Manual Training School of Philadelphia gives the heads under which such training may be classified in the resulting mental culture. It defines its training as: "1. Practical English—the language of clear and forcible expression. 2. Practical Government—the basis of good citizenship," (whatever this may mean; it sounds like history and the catechism). "3. Practical mathematics—for business, construction, engineering; Practical Science — The active working knowledge of the facts and forces of nature." The remainder of the course summarized as "Practical Hand Culture" is shown in the report by illustrations from photographs of young men engaged at the carpenter's bench and in building and plastering actual brick walls under the direction of tutors. If the difficulties thrown in the way of proper apprenticeship are forcing this kind of results upon young men it looks as if the present state of affairs is but a 'cloudy porch opening on the sun'. This schoolwork is an apprenticeship worth having and it is recognized by the employers of labour. The Pennsylvania Railway Company takes one third of the product of the Williamson School of Mechanical Trades. But the pupils in that school *are* apprentices. They are bound for a period of three years. The school takes them at the age of sixteen or seventeen and feeds and clothes them for the period of their apprenticeship. Something of this kind must be done. The drifting in and out in attendance which has been a difficulty at the Toronto Technical School will not produce anything worth having. As the report says, 'the problem of trade instruction seems to be to get the boys at the proper age and to keep them long enough.' There is no difficulty about it at the Williamson School; they are only able to accept one applicant in five. There should be no difficulty about it anywhere if the school is doing a recognized work. And it is only reasonable that young men who get their training at the expense of the community should undertake to fulfil the conditions necessary to make the training genuine.

The expense of a good school is considerable. The school at Springfield, which is especially spoken of as a model for Toronto, covers 30,000 square feet of ground, cost $350,000, including land and equipment, and the running expenses last year were $29,257. This is for a town about a quarter the size of Toronto; but the report states that one third of the total amount received from taxation is spent for educational purposes. It is apparently not being spent in vain in the case of this Technical School. There is an attendance of 500 boys and a daily percentage of 84.4. Tuition is free but attendance is not. Four years of varied practice in the use of hand and machine tools is required from every student who enters. The certificates granted by the school have, the report states, a recognized value in the community; and an opinion is quoted that in no part of the school system does a dollar go so far as here.

It is difficult to set limits to the value of a dollar invested in training the hands, (and minds), of the young men upon whom we are dependent in the end for the excellence of our manufactured productions. It is equally difficult to say, on the other hand, how far the process of degeneration in the work of the building trades will go, if some power does not intervene to train young men to good work and to give them a liking for it.

THE TORONTO EXHIBITION.

The Toronto Exhibition does certainly look now like a permanent affair—permanent because useful. In a way one knows that there is much manufacturing going on in this part of the country, but we are accustomed to think modestly of ourselves, and to regard our manufactures as "growing". A visit to the Toronto Fair now is enough to convince us that some of them have grown.

The extent and the quality of the manufactures has visible improved of late years and in the new Process Building one can see the making of some well-known articles in actual progress. The neatness of the manner of work in every case adds much to the impression of excellence in the manufacture; and the interest of the exhibition itself is greatly inhanced by these moving pictures.

The live stock is alway beautiful. In fact the substantial character of the exhibition is such that, with nothing but live stock and manufactured articles, complete and in process of production, the Fair would still be attractive. The present writer had great difficulty in tearing himself away from these things to attend to his proper business, which was amusement and the study of art.

The last was of a diffused character embracing every thing from Jules Breton's "Communicants" to the lights and shades of the avenues at night, and including the brown skins and sleek anatomy of the Igorrotes, the gentle savages from the Phillipine Islands.

There was some correspondence in the newspapers about the want of clothing of these people. One wonders if the writers saw them and if they really thought them indecent, and if so what their minds are like. They were naked enough, with only a breech-clout of dimensions no greater than was absolutely necessary; but to see one of these gentlemen leaning gracefully against the railing of their arena, clothed only in a grape-brown skin, and talking to a group of ladies with all the [illegible] about the personal appearance which a man of the world enjoys who has confidence in his tailor, was a lesson, (the show was said to be educative), in the respectability of the body. Even in our own country where clothes are normal, (normal unfortunately, one would be inclined to say in the summer), there are occasions where we uncover, for reasons sufficient and not concerned with display for its own sake, and find ourselves at home with the situation at once. The motive is everything, and the amount of display of the body by men and women—though there was no question in this case about the women, whose dress was much properer than the fashion—is to be measured by the motive and not by inches. Not long ago, in one of our own cities, they got a bishop into the box to testify as to the impropriety of certain theatrical posters, (which this article is in no way intended to support), and the bishop, with no more *savoir faire* than a curate, permitted himself to be led, (by the opposing counsel of course,) into fixing by measurement the limits of decency; only to be confronted at once with admired pictures by the old masters in which there were no limits at all. The intention is everything. The body itself is respectable; the only question is how it came to be displayed For this reason—being a question of motive—it is a question very difficult to judge of with certainty; but, in the case of primitive savages, well-meaning people who write to the papers, and well-meaning missionaries and missionaries' wives, who insist upon clothes, seem to be rather creating the feeling of indecency than preventing it.

There was nothing to offend anyone in the pictures exhibited in the Art Gallery and there was always a crowd there, apparently enjoying themselves. The remarks made were not in the recognized terminology of art criticism. "That tree is awful natural", or "isn't that water pretty", was briefer criticism than Ruskin's, but in line with his advice to (in general terms) find our way toward the culture of art by the admiration of what we like. There was a chance for every taste in the rather motley assemblage of loan pictures. The Frenchmen headed the show. Jules Breton's "Communicants", familiar to everyone from the engraving, was not, as sometimes happens, disappointing in the original, but rather the other way. Its delicate colouring was an addition, as was also the size which enabled one to get into the picture and fall in with the charming sentiment of the scene. This seemed to be the favourite picture. There was always a crowd in front of it. Greater technical excellence was doubtless to be found in Benjamen Constant's "Herodiade"—a portrait of Herodias' daughter that might have been painted from the original tiger. The soft suppleness of her figure would be a study for the painters, and a moralist could find the whole Roman Empire in her face; but right thinking agriculturalists and the writer did not enjoy her long, but, moved by the noble wrath that makes a London gallery hiss the villain when he is called before the curtain, turned away to the contemplation of the excellent George Herbert in his garden, portrayed with comparative feebleness by an English R. A., (William Dyce), but full of a peaceful poetry. A Leader landscape, in fine almost finicking oil, met with a good share of approval; a Constable—so rough as to suggest [illegible] seems to have often made, and not the final result—met with no approval at all. A brief look and "I don't like that" expressed a popular feeling which the critic, paying the perfunctory tribute of study to the work of a recognized master, could not but acknowledge was natural. Gustave Doré's imagination was displayed in a landscape which, as usual, gave one the idea but nothing else. Clarkson Stanfield on the other hand represented the fine old-fashioned school of composition, full of minor beauties, all carefully noted from nature and presenting truth; but the whole a little fabricated and suggestive of the studio. Another old-fashioned artist, Mulready, was represented by two pictures, well known to us by the engravings, which turned out to be small canvases very delicately worked. The *genre* interest of "Going to the Fair" and "Choosing the Wedding Gown", meets but moderate response now-a-days, and it is to be feared the small scale and delicate workmanship are not in our line either. But Mulready's work is of a mild kind. Sir John Gilbert, whose figures it was observed "stand out" well, was much more popular. If it is figures one one wants R. Caton Woodville is the boy. I stood long before his pictures, steeped in the contempt of a gentleman of culture who said that

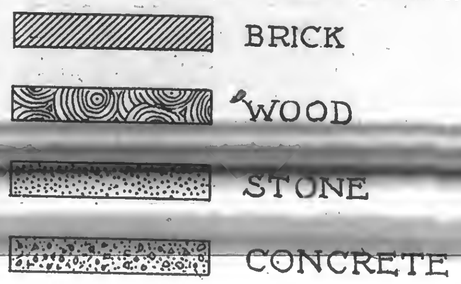
they were only "illustrations." The same remark was made about W. L. Wyllie's picture "The Passing of a Great Queen," representing the royal yacht passing through the fleet with the body of Queen Victoria. What is an illustration? Michelangelo's "Last Judgement" is not an illustration, partly because it has not happened yet and partly because when it does happen it will not be like that. Not a very positive recommendation for the work so far. What remains is the interest of the artist's conception—a matter of literary and historical interest chiefly, and usually a bore—and the beauty, (or kindred qualities), of the theme. This latter point is where the illustrator is apt to be hampered; but in Woodville's battle scenes the theme is heroic and is to be found in many a gallery, treated by the masters of art. The War-office did not try to makeour soldiers the same colour as the ground in the interest of art; but kakhi in the mass is not amiss, and there is always blood to brighten it up.

The grounds are still the unsolved question of the Fair. They are not exactly chaotic. Indeed at night, when subdued light marks off the part where the pigs are asleep from the brilliant main avenues where people are amusing themselves and looking at things, the general disposition of the grounds is seen to be right enough but there is a great want of arrangement at the amusement and manufactures end. Every visit to the art gallery is an exploratory expedition. The management is understood to be alive to the necessity of a plan; but there is all the difference in the world between a respectable plan, such as might be made by the management itself assisted by the civic officials, and such a plan as an accomplished architect would conceive. A coherent plan will be a a tough job now, with so many conditioning circumstances already established; but these very conditions would be the making of the plan, saving it from a too obvious formality and giving it the individuality which is so precious in any thing connected with the beauty of cities. The key to the plan is given by the avenues of grown trees, which are a feature now to valuable to be neglected; and the appearance of the main avenue, as it is, suggests an appropriate character for the whole design. The portals of the Process Building seen under the trees are exactly what we ought to expect for permanent buildings in a fair of this kind. The roofs of fair buildings are rather in excessive proportion to the walls; we do not want to see too much of them. Let them be masked by trees, and the wall and entrances only appear conspicuously. One would not advocate too much similarity in the building plans; but the E shaped front of the Process Building is conspicuously right, giving not only a satisfactory arrangement of alleys within but an exterior distinctly picturesque in a substantial way. The reëntering walls make quiet grassy courts where the plain brick walls in different planes have architectural value; and the three portals advanced to the avenue, with shady courts on each side, form an admirable composition, seen under the trees of the avenue. The columned porch of the central entrance with simple rusticated brick arched openings for the wings, balancing one another on each side of it, gives just the right quantity of architectural effect for the purpose. Particularly as seen at night, the effect of these entrances is excellent. Fair composition is essentially scenic and there cannot be a greater mistake than to suppose that the buildings must be extravagantly ornate either in general form or in detail. Two thirds of the design is the natural dignity of trees grass and water and *outre* or gimcrack buildings are quite out of keeping. Simple lines and plain material are far the best; and the management and the architect deserve approval for the character of the white brick buildings that have been erected recently.

Any notice of the Fair ought not to conclude without a lamentation of the permission given to vendors of eatables and drinkables, or anything else, to shout notices of their wares. They do not make a dollar more by it. People can see their stands perfectly, and if hungry or thirsty will buy. And for other people, or even the hungry and thirsty, to be annoyed at every turn by these raucous voices, magnified sometimes by a megaphone, inviting to hot sandwiches, ice cold drinks &c., is a serious drawback to the agreeableness of the Fair. There is plenty of noise of other kinds to make the place cheerful; these vulgar outcries only degrade it.

MATERIAL MARKS FOR BLUE PRINTS.

The practice of hatching the sections of a tracing, so as to represent the material and save coloring the blue prints, makes a great saving of labour. It is surprising that it did not come in at once with the adoption of the blue print. But, there were not so many blue prints made at first as now, since their reduplication is found to so greatly facilitafe progress and accuracy. It remains now to establish a standard of



marks, so that the blue prints of all offices will represent material in the same way.

Here is an illustration of the marks used in a prominent office in Toronto for the more evident materials. It would be a convenience if the table were extended so as to include other materials used in building and also such adjuncts as radiators, gas and electric light outlets &c. If any architectural body will devise a full table, we shall be glad to publish it.

In the Canada Gazette of August 18th the incorporation of the Dominion Portland Cement Company, Limited, is announced. The promotors are Messrs. Henry Domville, John H. Redpath, Harry E. Borradaille, Henry N. Chauvin, all of Montreal, and Charles Duclos, Westmount, Que. The capital of the company is $1,000,000 and Montreal the chief place of business.

A movement is on foot at Strathcona, Alta., to float a company for the purpose of developing a large stone quarry which has been found on the farm of Mr. James Mundy in the Calmar settlement. Mr. Carstairs, of Strathcona, is organizing the company. Competent experts affirm the deposits found to be of a very superior quality of building stone. The stratum is from five to ten feet thick and a very fine, hard blue stone.

OUR ILLUSTRATIONS.

PROPOSED COTTAGE FOR DR. ADAM, AT WINDERMERE, B.C. PROFESSOR PERCY E. NOBBS, A.R.I.B. AARCHITECT; MONTREAL.

The summer house with plenty of bedrooms and simple living quarters is a sort of thing much required in this country. When placed, as is usual, upon the water, so that the morning bath is taken out of doors, there is no occassion for anything but the structure, and this is built only for shelter, not for warmth. But there is a certain amount of indoors life. A wood fire on a chilly evening is one of the pleasures of the summer cottage. There is nearly always a good deal of hospitality exercised and the owner of a good summer house is identified with it, in the minds of his friends, almost more than with his less individual abode in town. The summer house in fact, for most of us, is the nearest thing we have to a family seat, which is the only thing that can be properly called a home. It is worth while therefore to spend a little more thought and care upon it than is usually done; so as to give it some distinctiveness and beauty. The invitation to design, though the materials are simple, requires some power of design to make a proper response, for it is not school architecture and the details are nothing to depend upon. It is a matter of form within very close limitations.

Now, if we examine Professor Nobb's cottage from this point of view, we see how much has been made of it without any exaggeration. The bedrooms are numerous, and the central living room, about 17 feet by 34, and two storeys high, makes a sufficient space for the general indoors life, with a small study off it for the host's private life or for the studious to find a place of retirement. The service department touches the room at one corner. There is plenty of character here and one can imagine what a help to the pleasure of our agreeable summer life such a country house would be.

In some respects it is not [illegible] to our less moderate summer in the east than to the rather English climate of British Columbia. We should require the kitchen to extend in a wing, cut off from the house by an open passage or verandah; and the large verandah on the south would require a covering. The two storey hall gives a fine opportunity to do this without darkening the hall, as an abundance of light would still come in from above. There would be some reduction of the upper window space if a verandah roof were inserted; but it would probably be a flat deck-roof, making a balcony on top reached from the gallery, and the windows could be kept large, with very handsome effect, by carrying them up into the roof, with dormer tops, and eaves projecting well so so as to keep out the vertical rays of the summer sun on the south. Venetian shutters in addition could be easily managed from the balcony.

OAK BAY HOTEL, VICTORIA, B. C., C. P. R. OFFICES, VICTORIA, B. C., M. F. M. RATTENBURY, ARCHITECT; VICTORIA.

There is a certain distinctness of type about British Columbia building that suggests the influence of the English architects who have settled there, and the English type of the climate. The conjunction of tower and gable in the Oak Bay Hotel is one of the privileges in composition which flourish in English work but are denied to us who have to look out for snow. The large gabled window in the C. P. R. Offices building is also reminiscent of England; and it is it, more than any thing else, that gives a sort of transitional character to the whole building. Its scale belongs to the many gabled type of building which is not our type. With our need for simple roofs, and simple, well-separated gables, we cannot very well have, as they do in England, a large building with a small scale. Our scale grows naturally with the building.

RESIDENCE FOR MR. ROBERT WIGHTMAN B. A., CORNER of POPLAR PLAINS ROAD & BALMORAL STREET, TORONTO. MESSRS GORDON & HELLIWELL, ARCHITECTS, TORONTO.

Here is a house of definite character. If the antithesis of the classical is the romantic, this is romantic design. An upper storey for the most part wooden, combined with the roof in such a manner that there is no particular place where the vertical ought to come, separates the upper floors from the ground floor so that the upper floor may have different dimensions from the lower and there is no particular boundary line for the lower floor; it may break out into any bay or projection that a pliable roof, with three pitches visible, can be stretched to cover.

The freedom in plan, however, extends no further than to the small irregularities that give variety or shape to individual rooms. The "lay-out" is strictly according to the rules of correct aspect for the living and service rooms, viz:—dining room, south and east; drawing room, south and west; kitchen, north and east; and study, anywhere that is left. Inside of these four walls of correct aspect, variety is welcome.

SCENES IN VENICE; FROM PHOTOGRAPHS BY MR. J. P. HODGINS, TORONTO.

The CORTILE SAN GREGORIO, formerly the cloister of an Abbey, is of the Gothic period, contemporaneous with the Ducal Palace. It will be observed that the upper storey rests on wooden beams, with templates cut in a manner suggestive of the east, with which her commerce brought Venice so much into communication. The columns are of marble, with with capitals of great beauty. The little cloister is one of the most charming spots in Venice.

The view of the CHURCH OF THE SALUTE is taken from the canal of the Giudecca, in the rear, and is interesting from the combination with the trees of the garden behind—a rarety in Venice. It is not, however, as good a view of the church, in itself, as that which one usually sees, from the grand canal in front. The views from the grand canal show with more certainty the alignment of the domes, one behind the other, and that the dome behind is smaller than that in front.

The Toronto Builders' Exchange have removed from the quarters which they occupied in the Yonge Street Arcade, and are temporarily located in the Sons of England building, corner of Berti and Richmond streets.

There are old abandoned quarries which it no longer pays to work for building or rubble stone that would yield a handsome profit if a crusher were installed and the product sold to the worker in concrete In all large cities the demand for this crushed stone is ever on the increase. In many places there is a positive dearth of sand or other material for concrete work and slag and ashes have been utilized. This, however, is not nearly so satisfactory as crushed stone and is usually used only as a last resort. Sand is getting higher in price as it becomes scarcer. The cost of hauling from great distances places the crushed stone on an equal footing.

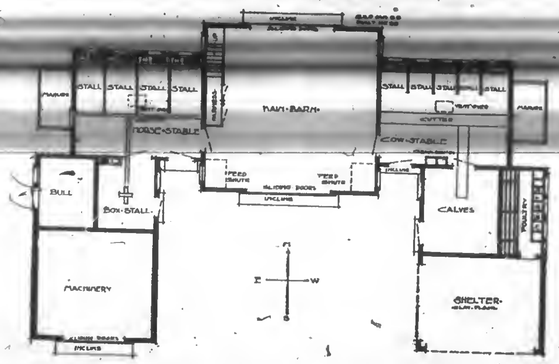
DESIGNS FOR STABLE.

By Victor W. Horwood, Architect, Winnipeg.

Fresh air, sunlight, freedom from changes in temperature and good drainage are maxims which should be kept well in mind during the construction of every stable. The subject of this sketch is a barn, with facilities for storing farm produce, as well as housing the live stock, and the plan is capable of being enlarged or reduced without destroying its symmetry. If possible the site should be on high ground with a southern ncline, and the box stalls in particular should be constructed so that one door opens to the south, while

another opens to the stable proper. The horse stalls are to be not less than 9ft. 6in. wide to centres of partitions, and are arranged so that the horses face the outer wall. The boxes should never be less than 10ft. by 10ft

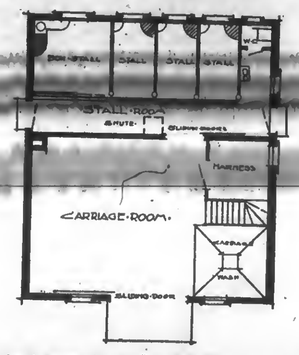
The main floor of barn can be used for sheltering loads in stormy weather and for all general cleaning and working purposes. This floor also has the hay shutes leading from it. The floors and walls of the stables should be double-boarded with two thicknesses of paper to prevent the penetration of dust and cold. The harness racks are constructed under the stairs



which are strongly built of two-inch planks. The foundations of the stable should be carried down below the influence of frost, and if no concrete floor is to be used the earth should be levelled and a perfectly tight floor laid. The most satisfactory floor for a barn is found to be as follows: An excavation is made to depth of two feet which is filled in to depth of sixteen inches with broken stone. Over this is laid five inches of concrete and finished on the surface with cement. The face of the this floor must be crowned and sloped to the gutter, and the covers of these gutters should be made of cast iron six inches broad with half-inch perforations, set flush with the floor. The gutters themselves should have a quarter-inch fall to their outlets. The concrete floor should be protected by means of strong wooden slats or gratings made in three feet by six feet sections, set perfectly level on top and bevelled on the bottom to accommodate the slope of the concrete floor, The best floor for the box stalls is clay, which although not durable is healthy, easily removed and requires no drainage; thorough ventilation is obtained by means of three feet by three feet windows over each stalls, placed seven feet six above the horses' heads, with ventilatort shaft fitted with louvre frames; the gutter outlet should be carried in the most direct manner possible outside of stable to cess-pool; the carriage wash drain may be connected with the surface drain as there is no organic matter carried down it, the closet should be the dry earth kind if no sewer connection is possible; the posts in the stalls must be six to seven inches thick, finished with a ball on the top; these posts will be set six feet six inches above the floor with the ends dipped in tar and imbedded to a depth of two feet six; down the centre of each will be worked a channel for receving the partition boards. The posts for the box stalls will be finished plain and carried seven feet six above the floor; the partitions in these stalls require to be strongly built of two-inch planks, tongued and grooved, No. 1 lumber being used in all cases; it is essential to keep the partition planks one inch clear of the floor and the tops of the partitions must be protected by the usual stall guards. It is evident that no projections or mouldings can be tolerated where loose animals are stalled. The box stalls should be wainscoted on the inside, flush with the walls and the doors should never be less than four feet for the passage of a horse; the stall windows will be

hinged at the top, made to open outwards. All hardware must be wrought iron with a black flat finish; the guards must be wrought iron also (cast iron should never be use), the bars to be three inches, apart, three-eighths thick, two feet two inches high, with a slope to twelve inches, top and bottom rail composed of quarter-inch by two inch iron; the mangers should be constructed of the non-wasting type, with the frame extending across the stall; the front of the manger may be built of planks; bridle brackets should be set about three feet six inches above the floor not closer than two feet eight; and harness racks seven feet four, not closer than two feet apart. In the cow stable, the stalls will be built entirely of wood four feet eleven in height with 8 feet 6 inches space for a cow from head of stall to gutter, having a width of three feet six; the floor will have a two-inch fall to the gutter; the animals may be secured by means of chains or stanchions, but if stanchions are used a little difference in length of stall must be made. These stalls are ventilated by windows so as to cause cross currents up the ventilation shaft. The calving stable is convenient to the main stable and has access to a sheltered yard; the cows will stand facing the north, and a root cellar may be excavated beneath the main barn floor, or a silo may be built according to the location on the plan. It will be necessary that all grain bins should be lined with zinc; the sheltered yard faces the south and has a covered shelter with poultry house opening into it the walls of which are to be double-sheathed, double-papered and as tightly built as possible. The machinery barn has a plank floor with large sliding doors, and the entrance to the large barn must be at least fourteen feet wide and twelve feet high.

The plan of the separate stable could easily be adapted to city or country requirments, but in our



limited space it is impossible to give all details, but we think we have enumerated the chief points. A great difficulty in planning stables, suitable to meet the conditions of such a rigorous climate, is the overcoming of the sweating of the walls, especially in brick or stone stables. This of course can be overcome to a great extent by using hollow walls and giving careful attention to the ventilation.

The Milton pressed Brick Company have been granted supplementary letters patent giving them permission to increase their capital stock to $250,000. This will enable them to largely increase their plant, which is already the pressed brick concern n Canada.

COMPARATIVE PERMANENCE OF BUILDING STONES.

In the Tenth Census, issued by the United States Government, the following table is given of the "life" of the various kinds of American building stones, by the term "life" being understood the number of years that the stones have been found to last without discolouration or disintegration to the extent of necessitating repairs:—

	Life in Years.
Coarse Brownstone	5 to 15
Fine laminated Brownstone	20 to 50
Compact Brownstone	100 to 200
Bluestone (sandstone) untried, probably centuries	
Nova Scotia Sandstone, untried	
Ohio Sandstone (best silicious variety), perhaps from one to many centuries	
Coarse Fossiliferous Limestone	20 to 40
Fine Oolitic (French) Limestone	30 to 40
Marble, coarse, Dolomitic	40
Marble, fine, Dolomitic	60 to 80
Marble, fine	50 to 100
Granite	75 to 200
Gneiss, fifty years to many centuries	

—*The Building News.*

METALLIC FURNITURE.

"Incombustible furnishings have a well-defined place in the scheme for producing a really fireproof building, and without them such a structure will never be entirely attained. The correct use of metallic furniture is postulated on a clearly defined theory, and that is—a properly prepared place in which to use it. In short, utilized to its fullest extent, it is employed less as a protection against fire than as a means of preventing fire. 'No starting point for fire' was the basic conception of its use, and that is the idea underlying its widest employment to-day. Metallic fittings should not be so used as to be exposed to hazards that properly should be met by structural conditions. The product is distinctly fire-resisting rather than fireproof, a fact that should be kept clearly in mind in planning for its employment. That it does possess the quality of individual protection to a large degree is abundantly witnessed by the repeated instances of security afforded by it under severe tests. Its true function, however, as stated, is the complete elimination of interior fire hazards. Speaking broadly, its possibilities in this direction have as yet been little appreciated, notwithstanding the constantly increasing demand for it. As a whole, architects have made but little study of the problem of reducing interior fire hazards."

There are practically no limitations on metallic furniture and fittings for public buildings, office buildings, banks, private offices, etc. Furniture of every variety and interior fittings are produced in sheet metal from architects' designs. Metallic furniture will stand hard usage, requires no repairs, is attractive and it *resists fire.—Insurance Engineering.*

P. Q. A. A. SKETCHING CLUB.

The visit of the 18th August was to the little town of Ste. Geneviève on the Rivière des Prairies. This being a village of some antiquity, there exists in the

vicinity a number of old, interesting stone houses some of which have interesting gate posts and other acces sories. The church which is dated 1854 is of good architecture and interesting both outside and in. We

give a view of the interior and also a view of a picturesque house which is unfortunately falling to ruin.

Messrs. Johnson, Calderon & Lines, architects Edmonton Alta., have dissolved partnership and Messrs. Johnson and Lines will in furture carry on the business in the old offices in the Lee block.

MONTREAL NOTES.

As the season advances the appearance of business in building operations increases. On many streets huge piles of brick and of stone, accumulated in readiness to place whenever the concrete foundations are ready to receive them, block up one third of the roadway and dispense with the necessity of wooden hoardings. The number of permits for new buildings naturally begins to slacken. Some of the more important recently issued are as follows :

Extensions to Olier school, Roy street, for the Catholic School Commissioners, consisting of the addition of two new wings at a cost of $67,000.

Extension to Messrs. H. Morgan's property on Beaver Hall Hill, estimated to cost $55,000.

Church of the Messiah, (Unitarian), Sherbrooke street, Ed. & W. S. Maxwell, architects, to cost $60,000.

Proprety 83, Amherst street, for W. Clark, $28,000.

Additions to National and Chemical Drug Company's premises, St. Gabriel street, to cost $18,300

The following monthly record of building permits clearly shows how busy things are this season.

January	65,975
February	158,481
March	262,215
April	873,440
May	855,580
June	$ 2,343,597
July	950,135
August to 23rd	273,800
Total	5,782,323

Permits for alterations amounted to $728,162, making a grand total of $6,510,485. The total for the whole of 1905 was $5,590,698.

In connection with this it is to be hoped that the increased municipal revenue said to amount to $300,000 which results from the increased value of real estate, will be applied to the improvement of the city. The state of the streets and pavings it must be admitted call most loudly for attention. While so much building is going on it is also urgent that attention should be directed to the improvement of street communications and to the more spacious treatment of the streets themselves. Another object which would have the sympathy of all interested in the appearance and well being of the city is the long deferred purchase of the balance of St. Helen's Island, which would make it second only to the Mount Royal Park as a city recreation ground. The price asked by the Crown is $200,000, which of course would swallow up a large proportion of the looked for surplus, but the ground is not likely to become any cheaper, and its desirability admits of no doubt. This park is the more important because the facilities, which might even be largely extended, for swimming. The city itself it not too well provided with swimming baths and the opportunities afforded by the island in this way are amongst the natural advantages of the city which for the sake of the health and vigour of the people it would be criminal not to make the most of. Another application comes from the Superintendent of Parks who points out that there is no regular supervision of the public monuments of the city and that in consequence some of these are in danger of lapsing into disrepair, that notably of Sir John Macdonald in Dominion Square is said to be in danger of falling.

A very regrettable thing is happening in regard to a

certain class of buildings in the city. One of the most flagrant instances is the older building of the Seminary of St. Sulpice in Notre Dame street. This until recently presented to the public a face of time worn but substantial and honest ruble work. It has now been cemented over with a particularly dirty ochrish colour, on which scrawly black false joint lines straggle about till what was delightful to the eye before is now gross and abominable. The wall enclosing the court-yard towards the street has received a wash of some very black and dirty stuff. We give a view of the rear of this building which is little known to the public, as it

looks out on the private garden of the Seminary, which still preserves much of its old world charm. The street front of the Seminary is no longer worth a snap shot from an artistic point of view. This is not the only building which has been suffering disfigurement, there are a number of buildings about the town—properties of the Roman Catholic Church which have been painting their faces in a most meretricious way, a circumstance the more to be regretted as in many instances they are, (though not to the same degree), buildings in themselves of an excellent quality. The Roman Catholic Churches have had the self respect and dignity—to put it no higher—to erect a majority of their buildings, for worship and other purposes, with wholesome simplicity, and yet with the worthiness of appearance which stone even when it is of plainest ruble can better than all other materials express. The church of St. James and the church of Notre Dame des Lourdes, both near the corner of St. Denis street and St. Catherine street, do not perhaps rank high as architecture amongst such buildings, but at least they are of stone. The black and white paint —both of the filthiest tone—with which they have lately been smeared gives them the air of a clumsy imitation of cheap-jack buildings in an amusement park. May the saints send better counsels.

It was announced some time ago, we know not with what prospect of immediate accomplishment, that a generous citizen had made a donation for the purpose of erecting a concert hall in the city. The object is a highly desirable one, and since the demolition of the Windsor Hall it is indeed a crying necessity which cannot be too soon met. For the coming season, however, it seems as it the old Victoria skating rink, now to be transformed into a concert hall, is to be our only hope.

Some interest attaches to the new buildings of the American Tobacco Company, now being erected in the western part of St. Anthony street by the Dominion Construction & Engineering Company. This is, we believe, the first application in Montreal, on a large and thorough going scale, of the principle of reinforced concrete construction. The external walls are of concrete reinforced with round bars about two inches from each face and at about two feet centres. The columns consist of four vertical steel angles held in relation by wire, the whole filled and cased with concrete. The beams are of round bar and concrete—lower bars straight and upper bars with upturning ends as in the Hennebique system. The floors of reinforced concrete are laid upon centerings, each centering being specially made and finished with a planed surface to receive the concrete. Indeed all the centerings, casings, etc., are of planed board previously prepared with a solution to prevent adhesion. All angles are rounded off and the junction of beam and column made with 45° filling or bracket. Whilst bricklayers' and masons' labor is dispensed with, a very considerable quantity of timbering, and consequently of carpenters' labour is employed. One advantage of reinforced concrete work being in the relative lightness or thinness of walls, it will be interesting to know what demands such walls in the winter climate of Montreal make upon the heating appliances.

WINDOW CLEANING IS EXPENSIVE.

The following was clipped from the columns of one of the large dailies :

"The cost of having house or apartment windows of ordinary size cleaned by professional cleaners is about 10 cents a window. So a man living, say, in an apartment having ten windows, would pay $1 for having his windows cleaned; if he had them cleaned twice a month $2, and if once a week, $4 a month; not a matter of very serious moment.

But when it comes to big buildings with many windows, the window cleaning question may easily be a very different proposition. The most recently opened of the city's great modern [illegible] windows. Obviously if it costs 10 cents each to have these windows cleaned the cost of a single cleaning of them would be $350.

If they were cleaned twice a month at that cost the expense would be $700 a month, or $8,400 a year; and to clean them once a week at 10 cents a window would cost annually $18,200.

As a matter of fact the expense is much less than that; but still the actual cost of the work, done partly by contract and partly by the hotel's own labor, amounts to a sum that many a man would be glad to have for a salary, or to have added to his annual income.

The cleaning of the windows of this great hotel from the ground floor up to and including the parlor floor is done by contract by a window cleaning concern. On the twenty floors above the parlor, the window cleaning is done by men employed on the several floors, a man on each looking after the windows on that floor.

For its part of the work the window cleaning concern sends eight men, and the number of men employed by the hotel that work on the windows on the higher floors is twenty. Thus it takes a considerable part of the time of 28 men to keep the windows of the big hotel in order; and the annual cost of the work of this one simple item of window cleaning is here about $6,500.—Building Management.

The new building for the Canadian Bank of Commerce at Halifax, N. S., will be of granite from the vicinity of Terrence Bay. Altogether 1,200 tons will be required.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Hamilton".—Will you please describe what is meant by slag cement, and how it is made and its various constitutents?

ANSWER.—After many and repeated failures in this country and Europe, it has finally been demonstrated without doubt that it is possible to make a safe and durable hydraulic cement from the slag from blast furnaces.

This wonderful economy utilizes a material that had until recently gone to the waste heap.

The cement seems to possess the good qualities of high-grade Portland Cements, and also the peculiar

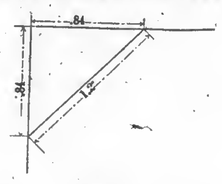


FIG. 1.

qualities of not staining the most delicate stone, and also of not swelling.

The low percentage of line, sulphur and oxid of iron together with fact that the whole combination has been made complete at the melting point by means of the intense heat of theblast furnace, seems to make this cement safe beyond doubt.

Slag cement is quite slow setting and requires more moisture in crystallizing than other cement to obtain the best results.

Many examples of ancient architecture now so much admired are worthy monuments to their builders, who used in the construction of these edifices cement composed of volcanic ash, or other material reduced by intense heat.

The following should be an average chemical analysis:

Carbonate of Lime	51.57 per cent.
Silica	27.15 " "
Alumina	10.80 " "
Oxide of Iron	0.90 " "
Magnesia	2.70 " "
Sulphuric Acid	1.38 " "
Water	3.50 " "
Undetermined	2.00 " "
Specific Gravity	3.10

Slag cements are manufactured in many placed in

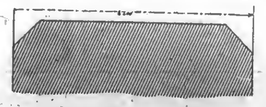
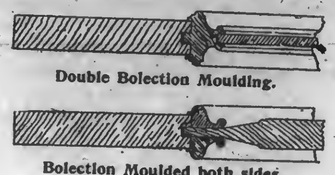


FIG. 2.

France, England, switzerland, Germany, Spain and the United States.

From "Young Worker".—Is there any rule for getting the right dimensions for making chamfers on posts, door stiles, or similar work?

ANSWERS.—One authority says—"Take one-sixth the face of the piece for the width of the chamfer." For example, a piazza post is required to be chamfered, the clear height between the bottom of the frieze and the floor being 8 feet; required the width of the piece and the face of the chamfer; 8 ft. = 96 in. (96 in. ÷ 12) x $\frac{45}{50}$ or 0.9 = 8 in. x 0.9 = 7.2 in. 7.2 in. ÷ 6 = 1.2 in, the face of the chamfer. 1.2 in. x Sin 45 Degrees = 1.2 x 0.70711 = 0.848532, or 0.84, to mark on each



Double Bolection Moulding.

Bolection Moulded both sides.

FIG. 3.

side from edge of piece, as shown in Fig. 1. This allowance may seem large, as shown on the section, Fig. 2, but when the post or column is viewed from an angle of 45 degrees the chamfer is none to wide. Of course there are exceptions to any rule that may be given. The section of the column indicated represents that of a post for a veranda, the height in the clear between bottom of frieze and floor being 8 feet, or 96 inches, and the width of the post 7.2 inches, the width being determined by Atwood's "Rules for Proportion."

From "Western".—Kindly explain what is meant by a Bolection moulding, its use and methods of using it?

ANSWER.—A Bolection moulding is any moulding projecting above the surface. It is generally used in panels as shown in Fig. 3 and may be used for many purposes. To make good work it should be screwed

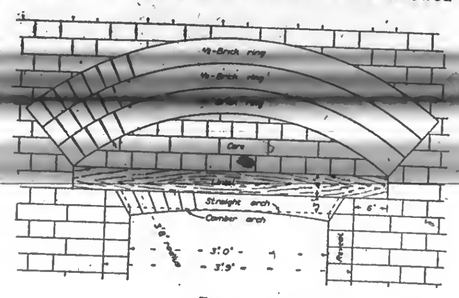


FIG. 4.

at the mitres, dowelled to the panels, and glued up and treated as a separate frame.

Double Bolection mouldings afford the best possible means, in the construction of framing, of counteracting the ill-effects of swelling and shrinking in large panels. The panels are fitted to the mouldings, and the latter mitred and screwed together around them; the moulded panel is then fitted to and wedged up with the framework.

From "Brandon".—I wish to know, of the proper method of building a relieving arch in brick over a wood lintel?

ANSWER.—The accompanying illustration, Fig. 4, shows what is wanted for a good arch. The camber

arch may be drawn with the soffit straight or slightly curved. It would be built with a camber of about 1½ in. The half brick rings should be built on a centre before the lintel is inserted; and after the centre is struck, the lintel should be put in and the core filled in between the lintel and the relieving arch. It is altogether a wrong practise to build the relieving arch on the core, as the whole load is then brought on the lintel instead of on the arch.

"From Brickbat" I am about to build a brick chimney shaft for a factory, flue to chimney underground, and would like a few pointers regarding foundation, footing to be of cement.

ANSWER.—No hard and fast rule can of course be given for the depth of foundations, as the nature of the soil and other circumstances render it necessary to consider each case, on its own merits. It frequently happens, however, that, owing to the flues being

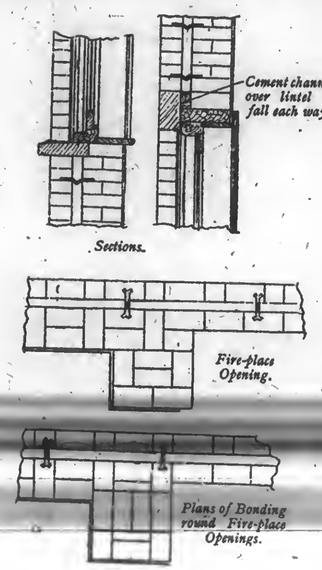


FIG. 5.

underground, the foundations start at a greater depth than is rendered necessary by the nature of the soil, and the excavation need not therefore be carried beyond the depth requisite to get in the required thickness of concrete for supporting the chimney. The area of the concrete should be such that the pressure on the subsoil does not exeed 40 tons per sq. ft. for the hardest rock, down to 1½ tons per sq. ft. for greasy clay and soft subsoils, with intermediate values corresponding to the relative hardness for different kinds of soil. If sufficient area is not allowed there is danger of the block being either forced bodily into a yielding subsoil, or, what is worse, setting unevenly by the superincumbent weight upon it. By the use of reinforced concrete a great saving can be affected in the necessary depth of the block. Old rails, rolled steel joists, and heavy expanded metal can always be used for this purpose, two or three layers being laid horizontally in the concrete at different levels, the axis of the different layers being kept at right angles to each other. Of the various soils gravel makes the best foundation for a chimney where obtainable, but sand is nearly as good if it is in an evenly moist condition. If clay soil has to be dealt with the foundations must be deep, but in a case where there is a moderately hard soil over a deep bed of soft subsoil, it is better not to excavate into the soft material but to spread the foundation well out and make them as shallow as possible in the top soil. When the reverse is the case, and if the top layer of soft

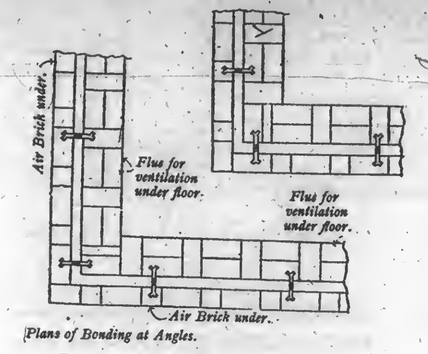

Air Brick under.
Flue for ventilation under floor.
Flue for ventilation under floor.
Air Brick under.
Plans of Bonding at Angles.

FIG. 6.

ground is not more than 15 or 20 ft. deep, it will pay to excavate down to the hard subsoil; but if the top layer is much deeper than 20 ft. it will probably be advisable to build on piles. This should only be resorted to, however, in exceptional circumstances. A general rule for the size of foundations is that the block shall not be less in depth than the thickness of the brickwork at base of chimney, 4 ft., and that it shall project beyond the footings a distance of at least 1 ft plus ⅓ the thickness of brickwork at base of shaft. In calculating the pressure on foundations a wind pressure of 30 lbs. per sq. ft. should be allowed for acting on one side of the stack, and the resultant pressure acting over half the area of the foundations should not exceed the load previously mentioned.

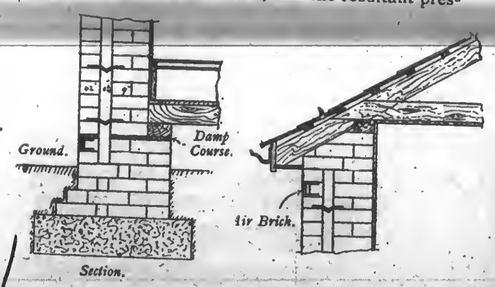


FIG. 7.

From "Westerner."—Please advise me as to the proper way to build a one and a half brick cavity wall?

ANSWER.—Hollow walls should be used for external work in damp situations exposed to driving rains. Such walls are of brick or stone, with a cavity of 2 in. or 2½ in. (See Figs. 5, 6 and 7). The external wall should be 4½ in. the thicker portion being inside, false headers being used in the outer wall, The thick

wall inside will carry the floors and roofs, the woodwork being kept clear of the outer portion, which is liable to be damp. The cavities should be ventilated by air bricks in the external portion at top and bottom. Care must be taken that to mortar or other drippings get into them; movable boards or hay bands should be used. The wall ties generally of cast or wrought iron, galvanized, or well tarred and sanded, should be placed about 3 ft. apart, horizontally and about 12 in vertically. Glazed stoneware ties are sometimes used, and at times purpose made bricks. In hollow walls care should be taken that the iron ties do not dip inwards, as water will in such case traverse even the double twist usually employed, The better shape has a V-drip in the middle. Openings in hollow walls—to prevent the west which may enter the air space dripping on the window or door frame a piece of sheet lead is built in on the inner side of the 4½ in. exterior wall, 1 in. turned up, and carried about 2 in. farther than the ends of the lintel.

From "Young Bricklayer"—I would feel under an

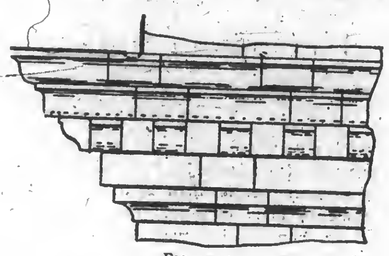


Fig. 3.

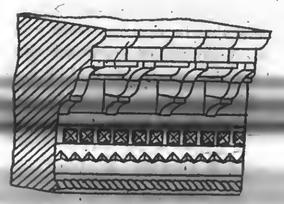


Fig. 4.

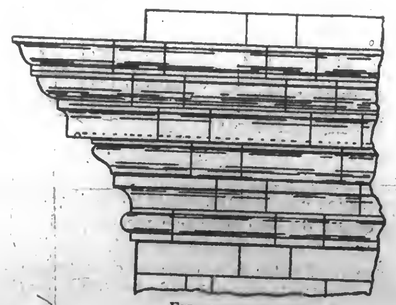


Fig. 5.

obligation to "The Canadian Architect" if you would publish a few deslgus suitable for brick cornices, such as may be formed by using pressed or common bricks.

Ans.—Manufacturers of pressed bricks generally publish a number designs of cornices suited to their make of bricks in their catalogues. These catalogues are furnished free on application to builders and bricklayers. You had better apply for our pressed brick

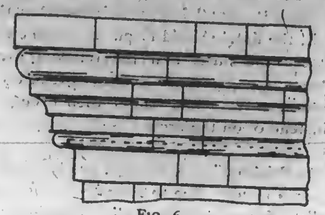


Fig. 6.

firms. We reproduce a few designs however, which we think may be of use. See Figs. 3, 4, 5, and 6.

FREEZING METHOD OF TUNNELLING.

Experiments are now being made by the Pennsylvania Railroad Company upon a new system of tunnelling for alluvial and water-logged soil, with the view of applying it in future operations beneath the East River, New York. The method may be thus briefly described. A small iron-lined pilot tunnel is first drived along the proposed line, and in it is installed a series of brine circulation pipes capable of freezing ihe moist material within a radius sufficient to permit the enlargement of the tunnel to the required dimensions without the necessity for employing compressed air. Of course, air-pressure would still be necessary for driving the pilot tunnel, but on a smaller scale and therefore far less likely to blow holes through the bed of the river beneath which operations aae being conducted. The result attained so far by the railway company is that the soil has been frozen for a distance of about 9 ft. in every direction outside the pilot tunnel, and it is hoped that it will be possible to obtain a frozen cylinder of 35 ft. external diameter, thus permitting the tunnel to be enlarged to the diameter of 25 ft. by an ordinary boring shield. If this method should prove to be a practical success it will do away with the delays ann risks inseparable from the use of compressed air.—*The Builder.*

ENGLISH PRACTICE.

In the House of Commons, Mr. P. W. Wilson asked the First Commissioner of Works whether he had received nny represention respecting the towers which appeared upon the plans of the new Government buildings facing Great George street; and whether he was prepared to authorize the construction of any or all of those towers. Mr. Harcourt answered: Yes, sir, I received a strong representation from the Council of the Royal Institute of British Architects in favour of the completion of the towers on the Great George street front of the new public offices. I replied to them in the following letter:—"I am much obliged by your letter of the 25th. Though I maintain my own opinion that the proposed very high towers on the Great George street front of the new public offices are not architecturally or æsthetically desirable, I am not prepared to put my artistic opinions against those of the Council of the Royal Institute of British Architects. I have, therefore, given immediate instructions that the single tower of the building now in course of construction shall be continued and completed on the lines originally laid down by Mr. John Brydon. I need not say that I shall always greatly value any criticism or assistance that the Institute is good enough to afford me in that part of my duties which is connected with architecture." I may add that I have asked the contractors to see that as far as possible the masons to be engaged on this work shall be those who were discharged on its suspension, and the contractor has promised to meet my wishes.

CANADIAN ARCHITECT AND BUILDER COMPETITIONS.

It is proposed to have three competitions for students and draughtmen, as described below, with prizes for each competition, and the cooditions that the Canadian Architect and Builder may reproduce for the benefit of its subscribers the designs of the prize-winners in each competition.

The intention is to offer suggestions of good design for the use of builders and others in the country, who erect buildings without consulting an architect.

Each drawing to be accompanied by a brief description of the material intended to be used.

Both drawings and description are to be signed with a *nom de plume*, and the same *nom de plume* is to be written on a sealed envelope which contains the competitor's name and address.

The drawings must be made in line for reproduction, and arranged within a rectangular border with sides in the proportion of 7 to 10. If drawn large, the lettering should be large in proportion, so as to be legible when the drawing is reduced to the size of the reproduction, which will be 7 inches by 10 inches. The scale must be drawn, not merely noted.

Competition I. Drawings to be delivered at the office of the Canadian Architect and Builder, Confederation Life Building, Toronto, on or before the 1st of December next.

This competition will repeat the theme of a small house in a country town. The cost to be between $2,000 and $3,000, exclusive of land. The lot will be supposed to be 50 feet wide by 150 feet deep, on a residential street in which the houses are set back 30 feet from the line of the lot upon the street. The house may be supposed to face any of the cardinal points of the compass; but must be planned to suit the particular aspect selected, and will be judged according to the manner in which this prime requisite of house-planning is treated.

There will be two sheets of drawings required in this competition. One will contain the plans and elevations and the other will contain certain details.

The drawings required are: plans of the ground and first floor, elevations of three sides, and a perspective in which the fourth side will be shown.

The ground floor plan must show the laying out of the grounds, as much as space will permit, and must have drawn upon it a diagram showing the points of the compass.

The sheet of details must show the porch, main eaves and gable, (if there is a gable), drawn to a scale large enough to show the construction, and giving sectional details to a still larger scale.

The prizes for this competition will be: First prize, $20; second $15; third, $5; fourth, a year's subscription to the Canadian Architect and Builder.

Competition II. Drawings to be delivered at the office of the Canadian Architect and Builder on or before the 1st. of January, 1907.

The subject is a farmhouse. There will be one sheet of drawings, similar to that required for competition 1; that is to say a sheet containing, within a 7 x 10 border, ground and first floor plans, three elevations, and a perspective showing the fourth side; but, in this case, as the cellar of a farmhouse is used for storage, there must be also a plan of the cellar; drawn on a separate piece of paper, so that it may be reproduced separately for insertion in the text.

There is no definite cost fixed; but there must be a limit. Houses quoted in the *Farmers' Advocate*, (which, as well as other farming journals, is recommended for consultation), range in cost from $1600 to $4500. A house of the former price was 31 ft. by 37 ft. The $4500 house is a well built frame house, on a stone foundation, and measures 26 ft. by 54 ft. in the main part with an 18 ft. x 36 ft. wing, the greater part of which is shed. This is an unusually good house with brick cellar walls, open fireplaces in the living rooms, bathroom with water supply, and in all respects well appointed. This scale of excellence seems to be above the ordinary, while that of the $1600 house is hardly sufficient for what is now recommended. It will probably be safe to rate the cost of such a house as is now wanted at about $2.00 per square foot on the ground. Competitors may plan for any size between the limits of $2,000 and $4,000. We want houses of different sizes: and the plans will be judged not according to size but according to merit within the size adopted. It must be remembered, however, as regards size, that compactness is a great gain where there are no household servants; and an unnecessary scale of accommodation, for dignity rather than comfort, is no merit in a design for an ordinary Canadian farmhouse. The first intention should be to save steps; not by squeezing to such an extent that the inconveinence of huddle takes the place of the inconvenience of oversize; but by a compactness of arrangement that will make the service department—dining room, kitchen, pantry, summer kitchen and woodshed—touch upon one another without intervening passages to traverse and keep clean, and, in general, throughout the house, will serve comfort by giving, as far as possible, exactly the space required for comfort—not less, but certainly no more. Waste spaces that require defence indicate the need for further study of the plan.

So far there is not much difference between a farmhouse and another dwelling, except that the kitchen must be a room of good size. But there are some special points to be considered.

The modern farm house is equipped with the appliances for water drainage. A septic tank with sul soil discharge can be built for a $100 or so, and is to be assumed as the method of drainage; so that the house will be equipped with the conveniences of an ordinary bathroom. But water supply varies, and it will be best to consider that the only dependence is upon rain water from the roof. For this reason there is usually a cistern room in the cellar with a tank from which water is drawn by a pump in the kitchen. To get water in the bathroom there may be either a bathroom cistern filled by a force pump, or the roof water may be led first to the bathroom cistern and overflow to the tank in the cellar. In either case one would think there is advantage in a ground floor bathroom. There is no particular reason why the bathroom should be on the bedroom floor. The morning bath is not in vogue in farm houses. After the day's work is over, and in the leisure of the evening is a much more serviceable time for this ceremony. A bathroom adjacent to the kitchen will make the supply of both hot and cold water easier. It might open off a back vestibule, which will be needed so that the men can take off their dirty boots before coming into the house. To have washing arrangements here also will be a good thing. It is not, however, intended to dictate the plan in this respect.

Besides the tank room the cellar will require subdivisions for a furnace and fuel, for vegetables, for fruit, and for milk. There ought to be a special entry to the cellar for this produce, and it might conveniently be the woodshed, (which in combination with the summer kitchen usually makes a one-storey wing in the rear). If, as is usual, the wood shed is beyond the summer kitchen and the depth of the summer kitchen has to be passed to reach the cellar, the situation invites to the convenience of an inclined plane.

These suggestions are not intended to give a complete account of the requirements of a farm house, but rather to suggest that the subject requires some study. This is best done, for those who are not in touch with farming life, by looking through a volume or two of a good Agricultural journal.

As to design, simplicity is of course necessary. The house will be more economical to build, to keep and to use, if it is simple in form. But there is no occasion to despair of its appearance on this account. A small building, on such a spacious site as a farm, ought not to have its mass much cut up. There is sure to be, in the summer kitchen, a minor mass that will take care of composition in the rear. The entrance front will have its necessary appendage in the way of porch, verandah &c.; and, an isolated building is always the better for having the entrance marked by something in the upper part of the building which expresses its position.

The prizes for this competition will be:—First prize, $15.00;

second, $5.00; third, a year's subscription to the CANADIAN ARCHITECT AND BUILDER.

COMPETITION III. To be delivered at the office of the CANADIAN ARCHITECT AND BUILDER on or before the 1st of February, 1907.

The subject is a shop front for a shop such as is usually occupied by a grocer, druggist, hardware merchant, &c.

The building will have light on front and back only. It will have a frontage of 25 feet, in which must be included a separate entrance for a dwelling above the shop. The floor plans of the dwelling must be given on a separate sheet of paper, so as to be reproduced separately on a small scale, for insertion in the text. What is required on the drawing sheet is only—an elevation of the whole front, to a scale of 8 ft. to an inch; a plan through the shop window to a scale of 4 ft. to an inch; and details of the shop window to a scale of 1 ft. to ¾ in. The whole to be arranged within a border with sides having the proportions of 7 to 10.

The prizes for this competition are:—First prize $15.00; second, $5.00; third, a year's subscription to the CANADIAN ARCHITECT AND BUILDER.

UTILIZATION OF ROOF SPACE.

Land is getting so scarce in New York that it has become necessary to use the roofs of houses for amusement purposes, as was done in the Oriental countries. From the windows of my room at the Hotel Gotham, says a recent visitor to New York, I could see two tennis courts on the roofs of houses in the neighborhood. Wire nettings twenty-five or thirty feet high have been erected and are firmly held by iron rods. The roofs are covered with gravel and fine sand several inches thick and the inclosure is just large enough for an ordinary court. Basket-ball courts are laid out on the roofs of several houses in the same way, and I suppose that sooner or later we will hear of football and baseball games on the tops of the skyscrapers.

"I'd like to make a contract for all the roofs on this private house block," said a speculator in real estate in New York city. "There are upward of twenty or thirty thousand square feet of roofs here that present waste space. But the owners don't seem to realize its value, and they wont rent it to those who know it worth."

There was a quiet shake of the head, which may have indicated anything from despair to shrewd speculation. Then in reply to a query, he added:

"What would I do with it? Why, convert it into an open air sanitarium in winter, and run it as a roof garden or children's playground in summer. Or if the owners objected to such uses I'd make a big greenhouse up here and rent it out to some gardener who knew how to raise hothouse fruits and vegetables in mid-winter. In the summer I'd cover it over with canvas to protect it from the sun, and you could get some of the finest flowers of the year right up here. Oh, there are plenty of uses to which it can be put. Why, only last week I was talking to an architect who said he was spending more time now over the study of the 'extra story' problem than anything else. The 'extra story' is what they call it, and it is the coming big thing in architecture and building. It's going to add a few million square feet of floor space to our city where sick people can live and breathe in the pure air and sunshine.

"Do you know how many square feet of roof space are devoted to winter sanitarium purposes in New York today? Well, as near as I can figure it out, there's upward of 200,000 square feet already in use for this purpose. The New York Foundling Hospital has nearly six thousand, the Presbyterian Hospital a couple of thousand, and Bellevue and all the other hospitals and public institutions have open-air wards on their roofs for patients suffering from pneumonia and pulmonary diseases.

"But it's not the public hospitals that are alone in this field. Private sanitariums are opening up. Doctors and companies are converting the roofs into open air wards. They are getting roofs cheap, too. What is the value of a roof? Oh, nothing, just a few dollars a week, says some unsuspecting landlord, and he signs a lease for five or ten years at a nominal rental. There are certain reservations about nuisances in the lease, and that is all. Then the sanitarium company covers the roof with a wooden floor, runs a six foot wall on the cold north and west sides and supplies a roof of canvas which can be rolled up or down at will. Some partition off part of the roof with glass. You get all the sun and fresh air that visits the city in winter. There is less fog, mist, dust and ashes up there than elsewhere. It is healthier by fifty per cent on the roof than in the street below. Those who need the sun and not so much cold air, bask and loll around in the sun parlors on the roof, and they recover nearly as rapidly as if they went South. Your modern doctor doesn't ship the consumptive to some sanitarium now as soon as the disease is discovered. He tells him to go up on his roof and spend the nights sleeping out in the open air and his days in resting or walking in the sunshine. Why, there's a big population now in New York taking the consumptive cure in the open air on the roofs. They're doing better than half of those who have exiled themselves from the city and relatives.

"The children are being considered by the designers of the new architecture A number of the modern apartment houses have roof playgrounds for children. They have toboggan slides in winter for them, and sand heaps to play in in summer. There is an open-air gymnasium on other roofs. A number of public men are advocating the building of all public schools and similar institutions with model roof gardens and playgrounds. They are bound to come soon, and the sooner the better for the health of the future generation.

"Talk about people's palaces, and the lack of space for them in the crowded districts! Why, the space is waiting for the builders free of cost. The roofs of the East Side houses—tenements, apartment houses, stores, schools and other buildings—could be converted into the grandest people's palace of which man ever dreamed. You could have glass-enclosed conservatories, outdoor gymnasiums, ball grounds, gardens in summer, sun parlors and reading rooms in winter. The people who now live without sun and pure air could then get all they wanted. Our architecture is all wrong when it does not make the roof of a city house or public building of service. They are ahead of us in this respect in Europe. Roof gardens, open-air gymnasiums and playgrounds are common in the cities of Northern Europe, and buildings are nearly all equipped with some sort of roof space for pleasure or profit.

"But there is even another point I want to mention. Some wise prophet predicted years ago that within another century all of our winter fruits and vegetables would be raised under glass, and that greenhouses and hothouses would spring up like mushrooms near great cities. He failed to see that they would spring up right in the heart of the city. But they are multiplying rapidly. With a wall on the north and northwest sides of the roof to keep out the cold winter weather, a hothouse or conservatory with a southerly exposure can be made to produce winter tomatoes, strawberries, lettuce and other vegetables. I have seen a number of experiments in this line. The glass-covered roof was heated with steam pipes connecting with the heating plant of the house. The boxes and pots of plants received more sun up there than they would in the country. The cost of raising them is no more than in the country, and better prices could be realized for them when plucked fresh for the table within an hour of the time they were needed.

"A good many of the roofs of our cities are used today for various other purposes. A number of pigeon lofts are located on them, and I understand the owners do quite a thriving business in raising squabs for the market. There are more than a score of chicken yards on New York roofs, filled mostly with fancy poultry, and as many dog kennels where sick dogs are kept in the sun and fresh air for clients. Down in the tenements the roofs are used more generally than elsewhere. They are the recreation places for many from sunny Italy or France, and not a few vendors of fruits and nuts ripen their green produce on the roofs in summer and fall.

"A number of owners of private houses in the aristocratic sections of the city have converted their roofs into winter and summer playgrounds for their children, and a good many of the older ones find time to go up there and have a snowball fight with the youngsters. They would never think of doing it in the street, but up on the roof it is quite a different matter. So you see, altogether the roofs of our cities are undergoing a great change, and from their final evolution we will secure great gains for city dwellers. I may be roof-crazy, but I would advise a young man to invest in roof leases rather than in ground leases. They are cheaper, and they have a potential value that may mean a fortune ten years from now to the lucky owner of the leases."
—*Building Management.*

BUILDING ON THE PERCENTAGE BASIS.

Investors in real estate, architects and many building contractors are coming to realize that the most economical and satisfactory method of erecting buildings of any size is on the percentage basis instead of on the basis of a lump-sum bid—that is the builder engages to erect the building or make whatever alterations are desired for the actual cost of the work plus a percentage as compensation for himself. Several of the large office buildings in Philadelphia have been built on this plan, and the indications are that it will not be long till it completely supersedes the old method of lump-sum bidding.

A REVOLVING TOWER DERRICK FOR ERECTING BUILDINGS.

There are many advantages both to the owner and builder in this method of building. Though the owner may not know exactly what the building is going to cost him the expenditure of his money is always within his own control and easy of verification at any time. He receives from the builder an itemized account of the cost of material, labor, etc., and he is relieved of the danger of "extras". The work can be carried on so as to best suit his own interests, rather than those of the contractors, and any changes which may suggest themselves during the course of erection can be made without unnecessary expense.

Contractors, on the other hand, are always assured of a decent profit on their work. They are not harassed by unexpected rises in the price of material or by penalties for delay occasioned by strikes or other causes often totally beyond their control.

In other words, the element of risk inseparable from the lump-sum basis of work is practically eliminated, and a builder is free from all temptation to "skimp" certain parts of the work to compensate him for unlooked-for inroads into his profits encountered in other parts of the work. With him all contracts are on the same basis, all can be treated impartially and the best interests of every contract can be served. This is particularly the case where the contractor makes a specialty of work on the percentage basis and declines all lump-sum contracts. The advantages to the builder of working on the percentage basis are indeed so many that many of the large builders, both here and in other cities, prefer operations of this character, though they are not prepared to refuse to work on the lump-sum basis if the owner so desires it, as is often the case.

It is necessary, however, that the builder should use the proper speed in construction, otherwise the building may cost the owner much more in the end than he could have it erected for a lump-sum bid.

Many builders, however, complain that investors do not, as a general rule, look with favor on the percentage system of work. They desire to be relieved of all risks, evidently taking the view that the risks properly belong to the contractor, and for this reason they prefer to accept a lump-sum bid, which may seem to them to be high, rather than assume risks which their knowledge or experience cannot help them to avoid.

The spectacle of contractors being forced into bankruptcy through contracts from which they had hoped to realize large profits, which occasionally presents itself, is not, it is true, calculated to reassure investors in real estate as to the wisdom of assuming most of the risks of building; yet failures of this kind occur so rarely as to have very little effect on the growing sentiment in favor of cost plus a fixed charge for all kinds of building work.—Quoted from the *Philadelphia North American.*

The incorporation of J. Vanalckler and Company, Limited, is announced in the Ontario Gazette, the object of the company being to carry on the business of builders, contractors and roofers. Toronto is to be the headquarters of the company. The capitalization is $40,000. Messrs. George H. Kemmis, Toronto Junction, and Gideon Grant, Toronto, are among the provisional directors.

A syndicate of Victoria business men has been formed for the purpose of shipping building stone and other materials to San Francisco. The syndicate controls recently discovered marble quarries on Nootka Sound, sandstone quarries on some of the islands of the Gulf of Georgia, a large lime plant, and some deposits of brick clay. Thus a very wide range can be covered by the project, which is likely to be carried out on a very large scale.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBER DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.
Branch Offices:
Room B, 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2290.
720-721 UNION BANK BUILDING, WINNIPEG.
536 HASTINGS STREET, SUITE 3, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	EDMUND BURKE,	Toronto
1ST VICE-PRESIDENT	W. A. LANGTON,	"
2ND VICE-PRESIDENT	JOHN E. BELCHER,	Peterborough
TREASURER	H. B. GORDON,	"
REGISTRAR	W. R. GREGG, 25 King St.,	Toronto

COUNCIL:

J. WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS

OFFICERS FOR 1906.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. B. VANIER, "
TREASURER	J.R. GARDINER, "

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal.
P. C. OUELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—A. R. DECARY AND C. DUFORT.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.	H. MARTIN.
THOS W. SELF, 1st Vice-President.	THOS. CHRISTIE.
C. W. BATT, 2nd Vice-President.	J. R. HOIDOR.
JAS. CRANG, Treasurer.	JOHN ALDRIDGE.
	JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND P. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.	J. JONES.
JNO. WHITTAKER, 1st Vice-President.	CHAS. GOULD.
GEO. HYATT, 2nd Vice-President.	T. WRIGHT.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.	H. STRATFOLD.
	A. NOBES.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

H. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M FEASE
H.A. BELL, Treasurer.	E. G. BAINE
T BRADLEY	D BAULT

WINNIPEG BUILDERS' EXCHANGE.

A.T. DAVIDSON, President. — A. E. PORTER, Secretary.
J. W. MORLEY, 1st Vice-President. — T. D. ROBINSON, Treasurer.
T. R. DEACON, 2nd Vice-President.
DIRECTORS: Thos Black, Jos. Bourgeault, R. Cass, D. Cameron, V. L. Bonch, Wm. Alsip, Ald. J. G. Latimer, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. P. Alsip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.	JOHN DUTHIE.
JOS. O. DESLAURIERS, Vice-President.	JOHN L. HARRINGTON
J. HERBERT LAUER, Secretary.	JOHN GRAY.
N. T. GAGNON, Past President.	ALEX. BREMNER.
W. R. RAMSAY, J. LEFEVRE.	J. N. ARCAND.
W. B. SHAW.	JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
R. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8, St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, JR., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUSSE Treasurer.	E z COTE.
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

SCHOLARSHIP OF THE PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

This Scholarship which provides for tuition free of cost in the complete course for the Bachelor of Architecture Degree at McGill University has been awarded by the Association to Mr. H. Roydon Dowswell.

NOTES.

The building permits in Toronto up to September 15th amount to $9,120,683.

We ascribe beauty to that which has no superfluous parts, which exactly answers its end.—EMERSON.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

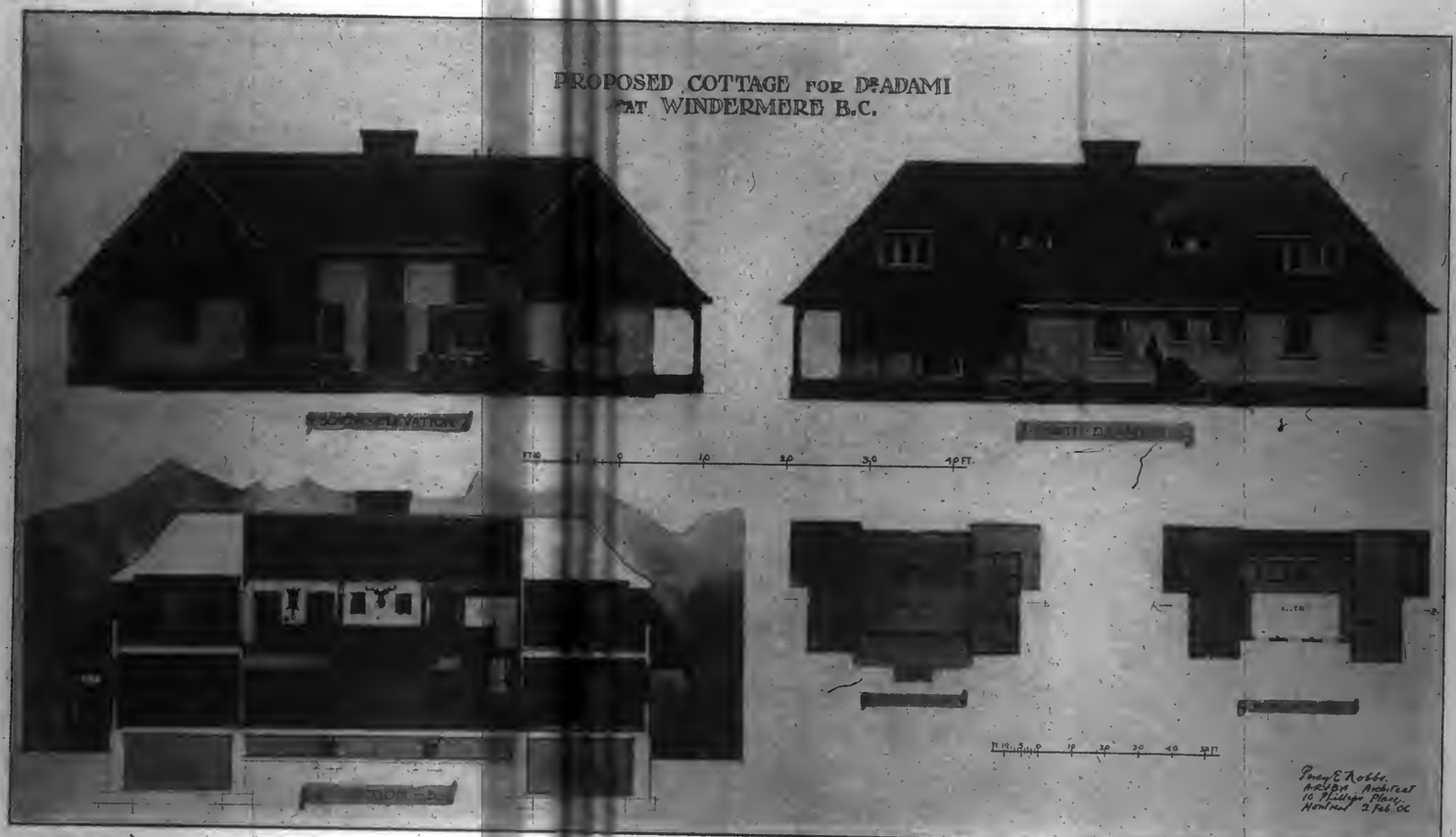
IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices



SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1906

PROPOSED COTTAGE IN WINDERMERE, B. C.

PROF. P. E. NOBBS, A.R.I.B.A., ARCHITECT, MONTREAL

THE CANADIAN PACIFIC RAILWAY OFFICES, VICTORIA, B. C.
MR. F. M. RATTENBURY, ARCHITECT, VICTORIA.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1906

CANADIAN ARCHITECT AND BUILDER.

OAK BAY HOTEL, VICTORIA, B.C.
MR. F. M. RATTENBURY, ARCHITECT, VICTORIA

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1906

CORTILE DI SAN GREGONIO, VENICE.

SANTA MARIA DELLA SALUTE.
VIEW FROM THE GIUDECCA.

FROM PHOTOGRAPHS BY MR. J. P. HODGINS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
SEPTEMBER, 1906.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 227. OCTOBER, 1906.

ILLUSTRATIONS ON SHEETS.

Emmanuel Church, Montreal.—Messrs. Saxe & Archibald, Architects, Montreal.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Houses in Victoria, B. C.

CONTENTS

Editorial	145-146	Canadian Architect and Builder Competition	157-158
Reason and Tradition	147	Competition for Advertisement Designs	159
The Duty on Foreign Plans	148	Soda to Set Cement	iv
Our Illustrations	149	Origin of the Word "Mews"	vi
Books	149	What is Truth	x
Seventh International Congress of Architects	150	Testing Materials by Sand Blast	xi
Montreal Notes	151-152	Architectural Failures	xii
Intercommunication	153-154-155	The Country Carpenter	xiv
The Extermination of the Mosquito	156		

To Designers.

The attention of designers is directed to a competition for advertisement designs by the publishers of the CANADIAN ARCHITECT AND BUILDER. Particulars regarding this competition are printed on another page of this number. There should be a large number of competitors in this new field of effort.

Experimental Disposal of Sewage.

The thing that daunts a municipal council in the question of sewage disposal is, more than anything else, the doubts that hang about the question. To spend a large sum of money in works that have something of the character of an experiment is not good business. When the thing is done there is every possibility that it will immediately become evident that it ought to have been done differently. There is, it is true, the experience of other towns to look to for evidence as to what method of work to adopt, but, quite apart from the fact that a big city cannot afford to wait until its problems are solved elsewhere, there is this peculiarity about the question that what suits one city will not necessarily suit another which is apparently the same in size and general conditions. Circumstances—the kind of manufacturing that prevails, or other conditions—so alter the character of the sewage that the method of treatment that suits well the sewage of one town may require modification before it will treat satisfactorily the sewage of another. It is a matter of experiment after all. But there is no occasion for a full size experiment. Any large business concern, with a problem of this kind ahead, would spend time and money in making preliminary experiments so as to arrive at a certainty before launching upon the large undertaking. This is what should be done by a large city like Toronto—in which the sewage question has become acute. As the lake is both the receptable for sewage and the source of the water supply the sewage must be rendered innocuous before it is let go even into the bay. The population of half a million that is promised to the city in the near future will spread for a long distance along the lake shore and will make a mighty flood of sewage, There does not seem to be much safety in letting it go crude into the lake or into waters confluent with the lake. So Toronto is face to face with the need for a thorough understanding of the nature of its sewage and how to denature it. Apparently this knowledge does not cost much. The city of Columbus, Ohio, had an experimental station going for a year at a total cost, for plant and operation, of $44,000. There were employed: An engineer and two assistants; a chemist and two assistants; a bacteriologist and two assistants; three inspectors; a stenographer, and a janitor. The station was connected with a main artery of the sewage system so that the character and quantity of the effluent was under observation at all hours of every day for a year. The result is a certain knowledge of the nature of the sewage and how to treat it, reported in a volume now before us, which fortunately it is not necessary to read—only to point to as an example of what should be done.

Competition Drawings

There was some discussion recently, at a lunch of the Toronto Chapter of Architects, about the character of drawings for competitions, with special reference to the Ottawa competition. The conditions as published in the newspapers, (one wonders how, for they are not yet issued), speak of line drawings, with blacked sections and windows—in fact the clauses drawn up by the Architectural Associations, in regard

to this matter. The present writer raised his voice in favour of holding to this condition and to its intention of keeping all drawings upon an equal basis in point of draughtsmanship. The meeting however was in favor of the more recent practice of washing and shading elevations with tints of monochrome. Things have moved on since the Associations drew up their conditions, and this is perhaps an improvement. There is in our illustration sheets this month a set of competition drawings of the kind which show that the process is explanatory without being necessarily deceptive. It was noticeable, however, in the discussion which led to the decision in favour of washed drawings, that there were several arguments advanced which implied or expressed in plain terms, the doctrine that draughtsmanship *per se* should be a factor in the competition.

If the attractiveness of drawings is to weigh—as it is sure to do, if attractiveness is permitted to be an end, even a subsidiary end—design will suffer. It is the promoters of the competition that the advocates of attractive drawing have in mind, (so they said), not the assessors. Could there be a more fatal policy! It is bad enough to distract the professional arbitrator by a display of inapposite excellences. He is but human, and should have correct judgment made easy not difficult. But how about his position with the assessors? If he finds a piece of great work; something with character, fit to rank with the world's masterpieces; but not likely to look well in elevation—something that will look monstrous, like the church of Santa Sofia; or uncouth, like the Pantheon at Rome; or crazy, like the Gothic Venetian palaces; or overpowering, like the Florentine Renaissance palaces, the Ricardi or Strozzi palaces; or monotonous, like Westminster Palace—how is he to justify his choice to the promoters, who see their glory established forever in another design, a beautiful alabaster front, (which later turns out to be brick), in a style easily recognizable as the very best of architecture, spreading itself with great dignity in front of a mass of the bluest of trees. If the mass of competing architects are so intent on playing to the promoters, by devices which will not bear analysis in point of purity of motive to let all designs have an equal chance so that the best may win, why should they expect the arbitrator to be free from the double motive. They certainly make it difficult for him. No man wants to play the crank to his clients, or to assume responsibility they want to take themselves. 'If they like the drawing,' he argues, 'they will like the work, at any rate they will not blame me.' And the commonplace triumphs. It is always likely to triumph if the drawings themselves are made an object of effort with the intention (openly admitted) of helping the design to "get there" by dint of drawing, if the design is not sufficient alone.

New Government Buildings at Ottawa.

The Dominion Government proposes to erect two groups of buildings upon Major's Hill, at a cost of about $3,000,000, and is going to invite a competition of Canadian architects for a design of the buildings and their surroundings, including the connection of these buildings with Parliament Hill by an avenue and a foot-bridge across the ravine of the canal. It is not proposed to commit the erection of the buildings to the charge of the successful competitor. The intention is evidently to have the design carried out by the permanent staff. This seems reasonable enough, as the buildings are to be erected within sight of the chief architect's office; and the first prize of $8,000 will no doubt pay the winner for the cost and labour of an effort ending on February 15th. It would pay better if the prize were $10,000. The symmetry of a total of $15,000 for the four prizes would be spoilt; perhaps also a larger first prize would upset a calculation fixing the amount of the prize list at one tenth of a five per cent. commission on $3,000,000; but doubtless, before the building is done, its cost will expand sufficiently to restore this ideal balance. It is not a good thing to skimp in the offer of prizes. The first sketch is the design—that which makes the difference between a good building and a bad building—for which it is usual to pay one per cent. of the total cost. The Government is going to get possession of no less than four designs for a charge of one half per cent. on the estimated cost. It is a good enough bargain to enable the Minister of Public Works to go further with the prize winner and make use of him as consulting architect during the progress of the work on his design. He ought to inspire the detail as well as the design and see that it is all carried out according to his ideas. A fair salary while the work is in progress would secure services sufficient for this temporary association with the chief architect's office. The outlay for it would be more than repaid by time saved to the office and work done. The chief architect is immersed in executive work; he cannot attend to the details. Some special direction will be needed for work of this character, and why not the direction of the designer of the work. The work will be harder to anyone else, and less likely to be successful.

The proposed conditions of competition "recommend" that "some phase of gothic style" should be adopted, so that the new building should harmonize with the government buildings on Parliament Hill. This is an excellent recommendation and, coming from the assessors, is likely to be received with respect by competitors. As the original set of buildings, parliamentary and administrative, were built at one time and under one designer, so that they are a harmonious group; and were well done, so that their gothic character is an honourable distinction; there is reason to continue the style in all buildings to be associated with the original group. Each building added in harmony with others, in a group, both adds to the importance of the original buildings and receives additional importance from them; just as planets in conjunction seem each to be brighter than when they were solitary. An example to the contrary may be seen in the group of buildings of the University of Toronto, where a noble site for the display of buildings has been spoilt by the abandonment of the style of the original building.

The habit of order is much more far-reaching than is generally supposed. It governs all arrangements, those of time as well as of place; it influences thought as well as action, charactor as well as conduct. It is the constant preventer of waste in every direction. Economy demands orderly and systematic arrangements. No disorderly person can ever be truly economical.

REASON AND TRADITION.

A new book by Mr. T. G. Jackson and a new book by Mr. Reginald Blomfield are reviewed together in *The Builder*, in a long article with the above title. Mr. Jackson's volume of lectures are collected under the title of "Reason in Architecture"; Mr. Blomfield's studies are of architects and works of the traditional Renaissance; the reviewer—if the editor of *The Builder* is himself the reviewer—is usually lucid in the direction of both reason and tradition; but so far as one can judge, from an acquaintance with Mr. Blomfield's book and this review of the other, there is no great light shed yet upon the application of either reason or tradition to architecture as it is practised in our generation.

The attitude of these and other critics towards current architectural construction is that of despair; apparently because the method of construction is what it is instead of something else. The review says:—"Formerly walls were built first and girders, where required for large floors, were placed on them or built into them as they went up; now the iron standards and girders are built first and the walls built as screens round them." That states the situation. But why should we talk about it in a complaining manner? It is our problem. "If iron is to be the essential construction," Mr. Jackson is said by the review to urge, "let the architectural treatment express the fact, and not continue in a commonplace and gewgaw manner, a method of design proper to masonry construction. Among other suggestions, he asks why should not a visible iron framework be used, filled in with whatever material is desired for walling, just as half-timber work used to be used in the days when it was a real construction and not an archaeological pretence; the iron framing taking the place the oak framing once took."

And if the iron framing took the place once taken by the oak framing, what would that be but an archaeological pretence? It would be a case of tradition taking the place of reason. For wood this construction is excellent; but iron requires protection. Iron must therefore be concealed and with its concealment we initiate a new school of design in which the whole array of precedent for exhibited and adorned design is useless to us as precedent.

It is a hard case and one which apparently gets little sympathy from the learned. Yet that is what they must give us if they are to do any good. This effort to find a way of working new material in an old manner is work for a school boy not for a scholar. It is trifling. The architect is a man of his time. The conditions are fixed for him by the material in use; it is left for him only to develop beauty from them. The condition of an embedded skeleton is ours. The skeleton and its covering have both constructional reasons; sound constructional reasons we believe. At any rate there they are. They are our generation's form of construction—one form. The other, reinforced concrete, is of the same kind, in point of there being no decorative motive involved in the actual construction. There is plenty of analogy in nature for a concealed skeleton as the basis of a beautiful structure, but the parallelism is not complete. The skeleton in nature is only a frame for a covering which is as much or more the essential structure: In our steel frame buildings the skeleton is the chief part of the structure, and the covering is for the most part only covering. The muscles which keep the human body erect, and by their contour and modelling give it beauty, have no analogy in the irresponsible masonry of protected steel building. The walls, as a whole, have a little variety in their nature. They consist of piers and filling, and there are openings with some simple accessories. Floors have some individual life in their construction, but the necessity for completed protection is so serious that it is better to envelope every bearing member deep in protection and obliterate constructive lines. Externally also the roof is flat. We cannot pitch roofs towards the street, and shed masses of snow upon the sidewalk; nor can we pitch towards a party wall, and collect the snow in a horizontal valley.

So the reasonable construction of our building leaves us with something not far removed in appearance from a packing box. Such is our architectural problem.

We may not wriggle but must face it fairly. Any attempt to torture the construction into an unnatural visibility, in order that we may contrive a "straight forward" design, is a bad kind of deceitfulness—deceiving one's self. How it can end in anything but a plain lie, after all, it is difficult to see; there being still the necessity of concealing the iron.

There have been many lies concocted for the sake of Gothic truth; all from the best motives; on the understanding that Gothic truth is all truth, as concerns architecture. But is it? There is the other style and the other kind of truth. Gothic architecture is incomparably the more delightful and interesting style, and to exercise the intelligence that conceived its execution seems a more joyful life than elaborating Greek perfection; but enthusiasm for Gothic architecture does not prevent the suspicion that the Greek is the higher flight of intellect. It was at any rate, a condition precedent of the other. Aesthetic truth is the first truth in architecture, and survives all others. Its expression, which ran through the Gothic period, survives the decline of the special structural conditions of the style, (which perhaps our Georgian architects were right in thinking too barbarous for our age), and survives for application to our inarticulate, encased, structure.

Now as to the application. The review before us says that "ornament is only desirable so long as it . . assists, or at all events does not contradict, the expression of structure." We must, for the purpose of our type of structure, take this doctrine in a large sense. We have no structural details to ornament, or to make ornamental. The enthusiastic statement, one so frequently meets with, that the reinforced concrete building is "a monolith", is as true in total result, though not in actual construction, of the building which consists of a steel frame encased. The building is unified and we must regard it as a whole.

Leaving out of account such chances as there are of an external expression of the functions of piers and wall-veil, or an internal expression of floor structure, or any other structural variation of surface that may be made to tell its story—there are several features necessary for the aesthetic expression of buildings, and as necessary for this monolith as for another. These are such things as the base, the cornice, the finish of angles (whether of openings, or of the building as a whole), protective heads to defend windows, sills to defend walls, etc.

The base is not a constructive feature. It is true

that the lower part of a wall should have extra thickness and that the upper wall should bear on the centre of the lower; but we do not build it so. The inconvenience of doing so is greater than the need of it. We make a small offset or a difference in material, merely for the purpose of expression—for aesthetic reasons. We should therefore continue to do so.

The cornice is not a constructive feature. It *could* shed water clear of the wall if it were allowed to do so; but cornices have usually been provided with gutters; and, unless we are mistaken, temple walls had cornices before temple roofs were pitched. The cornice is there to emphasize the top of the wall. Its purpose also is aesthetic, and as necessarily applicable to the wall of a monolith as to that of any other description of building.

In the same manner the sills:—what constructive function they have is still required, and the aesthetic emphasis of it also. There is an interesting account in Garbett of the *rationale* of the blocks one finds under the ends of Venetian Gothic sills, just under the architraves of the opening. These have no constructive function, though the sills project a good deal. Their purpose is aesthetic; to finish the line of the architraves with a handsome blob where they are crossed by the line of the sill. Any one can see the value of that. It is a good example of aesthetic truth. Garbett credits the designers of guttae under the Doric triglyph with an understanding of it, if not with its discovery. It and other truths of a like nature are as old as architecture, and why should we—how can we in fact—dispense with them now?

It does not follow however because we must have a cornice it must consist of cyma reversa, dentil, astragal, ovolo, etc., etc. Particularly if the cornice is not of stone, may we claim a rest from this monotony. It is not true, as scholars tell us, that further invention is impossible. It cannot be true. The evidence is the other way. What a difference there is between a cornice of the Orders and the cornice of the Doges' Palace, or of the Ca'Doro at Venice! Yet these latter are quite satisfactory. They are made up, it is true, of old elements—a row of tombstones and a string course. In that sense, of course, there is no invention; but nobody wants to invent new elements, any more than we want to invent a new scale. It is new times we want. And there is no reason why we should not get them.

THE DUTY ON FOREIGN PLANS.

We have received the following copy of a letter to the Registrar of the Ontario Association of Architects, enclosing the new Memorandum of the Department of Customs for the guidance of Appraisers in fixing the duty payable on important architectural drawings:

OTTAWA, June 13th, 1906.

The Secretary, the Ontario Association of Architects, Toronto, Ont.

DEAR SIR,—Referring to the representations made by your Association to the Tariff Commission at their session in Toronto in November last, relative to the Customs treatment of imported blue prints and building plans, I beg respectfully to enclose you herewith for your information a copy of memorandum of instructions which has been issued by this Department for the guidance of its officers throughout the Dominion.

Yours very truly,

(Signed) JOHN BAIN.
Secretary, Tariff Com'n.

APPRAISERS' BULLETIN NO. 152.

File No. 47, 693.	For the Guidance of Customs Officers.
INDEX SUBJECT.	Commissioner of Customs.
Blue Prints and Architects Plans.	Department of Customs, Ottawa, 7th June, 1609.

CURRENT VALUES FOR DUTY-(CLASS B).

ENTRY OF ARCHITECTS' PLANS AND BLUE PRINTS.

Memo. No. 7278 respecting Architects' Plans is cancelled and the following rules are submitted for guidance in the entry and appraisement of such plans:—

1. The rate of duty on Drawings, Blue Prints and Building Plans is 20 per-cent ad valorem under Tariff item 130. Specifications, however, are free as "manuscript," when written or typewritten.

2. Special Plans of Buildings, or blue prints as substitutes therefor, are to be valued for duty at the charge usually made by the Architects for the drawings, without the specifications. This charge may be fixed for duty purposes at one per cent. of the estimated cost of the building to be erected.

Detailed drawings, or blue prints as substitutes therefor, if imported separately, to be appraised at a valuation of one per cent. of the estimated cost of such detail.

3. When the building is estimated to cost less than $10,000, the plans or blue prints thereof may be appraised at the usual charges for furnishing same, according to the special circumstances in each case irrespective of the preceding rule (No. 2).

4. Blue prints or copies of Building Plans may be admitted at the cost of production when duty has been once paid on the original or a copy thereof in Canada under the foregoing rules, upon proof of such payment to the satisfaction of the Collector at the Port of entry.

5. Blue prints of cars and machinery, being copies of standard designs, may be valued for duty at 75 cents per pound.

COMPETITIVE PLANS FOR EXHIBITION.

6. Competitive Plans brought in for inspection may be entered as for warehouse and inspected under Customs supervision, subject to payment of duty within 60 days unless then rejected and ex-warehoused for exportation.

JOHN McDOUGALD,
Commissioner of Customs.

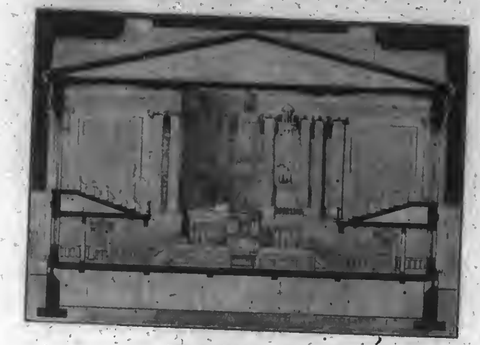
Although building plans by foreign architects are dutiable, the collection of the duty has been based upon an estimation of the value of plans that reminds one of the appraisement of an oil painting as so much for the paint and so much for "the man's time a layin' of it on". The customs officers have shared the general misconception of the nature of an architect's drawings, and rated the value of incoming blue prints by the time they supposed to have been necessary to make the original tracing—say five to ten 50 cent hours. The Associations of Architects, both of Quebec and Ontario, have more than once objected to this estimate of the value of architectural drawings, and have stated the doctrine, which it seems so impossible for the man in the street or the man on the bench to understand—that architectural drawings are not an end, but an instrument towards an end, which is service. In this case it is clear that the building-owner's importation is the service of the foreign architect. The drawings are the means by which he executes the service for which he was employed, viz. the erection of a building; and their passage through the Custom House marks the occasion of the importation. Whatever the architect charges the client is the value of the importation, and the customs rate should be assessed on that. These charges, which range from one per cent. for preliminary to five, seven and ten for complete services, are not likely to trouble the Custom House in the preliminary stage, when the tracings are small enough to travel in a letter. It is working drawings that come into the country in such bulk that their nature has to be acknowledged. The rating of one per cent. as the "charge usually made by the architects for the drawings" is therefore still below the mark as regards the value of the services represented by the drawings. It is quite unnecessary to present this valuation in the form of an assertion that it is "the charge usually made by the architects for the drawings", and there is no reason to believe that the Department of Customs does not perfectly well know that the statement is untrue. The valuation of an architect's services has been explained to the Department more than once, fully accompanied by printed documents.

OUR ILLUSTRATIONS.

EMMANUEL CHURCH, MONTREAL. MESSRS. SAXE AND ARCHIBALD, ARCHITECTS, MONTREAL.

To one who has studied the churches of Wren and his followers, this type of plan seems to embody the idea of a Protestant church. It is eminently fitted for preaching, without losing the form which we are accustomed, for good reasons, to look upon as peculiarly suited to common worship.

The plan before us seems to be worked out perfectly in every respect. The conditions point to a symmetrical arrangement of the rear. It would be equally good, in the style, if the conditions forbade symmetry, and required that most beautiful kind of composition the classical picturesque.



TRANSVERSE SECTION.

It is the low-pitched roof that generates the classical feeling. It suits our methods of construction, and harmonizes with our general manner of building. It gets over the objection to Gothic, as usually practised, that it is out of keeping with our time and the buildings in which we live our daily life. If there is any influence of architecture upon the mind, it cannot be a good thing to have religion associated with surroundings that are so distinctly not of our own century.

Gothic architecture, (real gothic), is lovely, and the Orders are a bore. If we must abandon the one we do not want to fall entirely into the clutches of the other. It is interesting to note, in the side elevations before us, slender pilaster shafts at the windows that are more than half Christian. If their sire was a pilaster their dam was certainly a vaulting shaft. Their proportions are unknown to Vignola, but they are as classical as anything measured by diameters; because the face of the pilaster is the same as the face of the wall, and the ornament, (cap and base), is an excrescence beyond this line. The ornament is æsthetic not constructional. That is why it is classical in feeling, and that is why our work tends to be classical. The question has nothing to do with the Orders.

The building is being erected on the east side of Drummond street within 200 feet of Sherbrooke street. The materials of construction are grey pressed brick and Indiana limestone. The interior is finished in hardwood and the windows of the church proper will be leaded. The entrance vestibules will have marble floors and the walls, to a height of nine feet, will be lined with marble. Above this will be an ornamental plaster ceiling. The ceiling of the Auditorium will have flat panels and intersecting plaster beams, ornamented on the soffit. The building is heated with a combination system of hot water and hot air. The cost, including all furnishings, is to be $100,000.

HOUSES IN VICTORIA, B. C.; THE WORK OF MR. F. M. RATTENBURY AND MR. S. MACLURE.

The lovely setting of these four houses gives them, at first sight, a similarity in appearance that disappears upon closer inspection. Mr. Maclure's cottage classes with American work. It is an architectural composition which can be stated—large and small mass similar to one another, linked by the dormer which is similar to both. The details also have an established form which to some extent conditions the design. All this formality in so small a house is difficult to keep within the limits of refinement. The success in the present case will be seen to be due to simplicity. Besides the dormer, there is but one feature, the colonnade; and that is so continuous as to be an integral part of the mass.

It is not so easy to put the composition of Mr. Rattenbury's houses in a formula. They exemplify very well the idea of the natural growth of elevation from plan and give pleasure rather after the manner of natural objects, without inviting to analysis or criticism. Neither systematic features nor ornamental details are likely to develop much under this elastic method of work. Details in simple work, will be purely constructive, and unnoticeable. It is the handling of material in the mass that gets particular attention,—as in these interesting rubble walls. The result is a harmony with nature that makes this type of house, much more than the formal design, a part of the landscape. If the reader will take a magnifying glass, so that he may place his eyes close to the cut, at the point of sight for the perspective, he will find in the left hand corner of No. I, along the lower storey of No. III, and at the entrance of No. IV, a harmony of house and garden that is as charming as one could wish to have it.

BOOKS.

BUILDING CONSTRUCTION AND DRAWING, BY CHARLES F. MITCHELL, ELEMENTARY COURSE. PRICE 3S. BUILDING CONSTRUCTION, BY CHARLES F. MITCHELL, ADVANCED AND HONOURS COURSE. PRICE 5S 6D. NEW EDITIONS. PUBLISHED BY B. T. BATSFORD, 94 HIGH HOLBORN, LONDON, W. C. The need for new editions of these works occurring at a time of great progress in the science of construction and in the direction of the standardization of materials, the original matter is rewritten to a great extent and largely extended, and there is a new chapter on the subject of reinforced concrete construction. The authoa has modernized and simplified the calculations, and included specifications of the Engineering Standards Committee relating to portland cement and structural steel work and British standard sections.

Some time ago, says *Indian Engineering*, the consulting architect to the government of India was ordered to be supplied with photographs of all new buildings, with a note thereon of the date and hour that they were taken, in order to enable him to judge more accurately as to the effect of the sun on the buildings. It has now been decided that the usefulness of these photos would be further increased with the supply of information as to the plinth area rate, and details of the materials used in construction.

SEVENTH INTERNATIONAL CONGRESS OF ARCHITECTS.

REPORT OF MR. ALCIDE CHAUSSE, OFFICIAL DELEGATE OF THE CORPORATION OF THE CITY OF MONTREAL, OF THE PROVINCE OF QUEBEC, ASSOCIATION OF ARCHITECTS, AND OF THE MONTREAL BUILDERS' EXCHANGE. STEWARD-INTERPRETER, MEMBER OF THE BOARD OF THE PERMANENT COMMITTEE, ETC.

I beg leave to report that I have attended the International Congress of Architects, held in London, from July 16th to 21st, to which you had delegated me as official representative of the Corporation of the City of Montreal.

At the opening session which was held in Guild Hall under the immediate patronage of H. R. H. King Edward VII, and the honorary chairmanship of H. R. H. the Princess Louise and H. H. the Duke of Argyll, the Honorable Lord Mayor of London, Sir Walter Vaughn, Bart., the Sheriffs of London being present. Addresses of welcome were read by the President of the Royal Institute of British Architects to the members of the Congress which had been delegated by different nations.

These official delegates in their replies to the president's address offered their thanks for the cordial reception which was given them.

The same evening a brilliant reception was given in the room of the Royal Academy of Fine Arts, where we had the pleasure of viewing the finest collection of paintings by the greatest artists of the Empire.

On Tuesday (the 17th) after having taken part in the proceedings of the first meeting of the Congress, we attended a magnificient reception given in our honor by the Honorable Lord Mayor and Lady Mayoress of London, in the Mansion House, where renowned lyric artists and a fine orchestra contributed to the magnificence of the reception.

The meetings of the Congress were held simultaneously at the rooms of the Royal Institute of British Architects and at the Grafton Galleries. At this last place I had the honor of being appointed Honorary Secretary of one of the most important meetings.

The different questions discussed by the members of the Congress were of the utmost importance. The architectural copyright and ownership of drawings in all countries was the principal question. The resolution adopted, after much reading of paper and discussion by the members of the Congress, proved to be the main subject of the Congress; and the matter will be laid before the different governments so that proper legislation be enacted to protect the architects in every country.

The resolutions adopted by the Congress were the following:

SUBJECT I.—"*The Execution of Important Government and Municipal Architectural Work by Salaried Officials.*" Resolution adopted: That in the future and in the interest of adminstrative bodies and the public, and in the higher interests of the art of architecture, public bodies, (whether Governmental, Provincial or Municipal), should entrust important architectural works only to qualified prolessional architects, either by competition or otherwise.

SUBJECT II.—"*Architectural copyright and the ownership of Drawings.*" It was resolved: That this Congress is of opinion that the architect is employed to produce a building, and that all drawings and papers prepared by him to that end are undoubtedly his property.

It was further resolved: That this seventh International Congress of Architects assembled at London in 1906, recalling on the one hand the resolutions passed during the past twenty-eight years by the International Congress of Architects and the International Congress of Artistic copyright, as well as by the International Congress of the Association Littéraire et Artistique Internationale, notably at Madrid in 1904; recalling on the other hand, the "Protocle de Cloture" of the Diplomatic Conference held at Paris in 1896, which upholds the principle of complete protection of works of Architecture; recalling, finally, the Spanish law of 1876 and the French law of 1902, both which expressly protect works of Architecture. The Congress is of opinion: 1. That architectural designs comprise design of facades, exterior and interior, together with the plans, sections and elevations and they constitute the first manifestation of the architect's idea and the work of architecture. 2. That the building is but a reproduction, on the site, of the architectural drawings; and this Congress renews the resolution that works of Architecture be protected in all legislative erectments and in all international conventions equally with every kind of artistic work.

SUBJECT III.—"*Steel and Reinforced Concrete Construction.*" Resolved: That this Congress considers it desirable that an inquiry be made as to what failures have taken place in reinforced concrete buildings, and as to the cause of the failures, and that this Congress is of opinion that, where reinforced concrete is intended to be fire resisting, the greatest possible care should be taken as to the nature of the aggregate and its size, as also to the protection of the steel.

SUBJECT IV.—"*A statutory qualification for Architect*". Canada was found to be the only country, where, in the Province of Quebec, a Diploma of Architecture is necessary in order to practice as an Architect. It was resolved; that it is desirable, in the interests of the public of all nations, and in the interests of architecture, that practitioners should have a statutory qualification.

SUBJECT V.—*The Education of the Public in Architecture*". This subject was much discussed but no resolution was proposed.

SUBJECT VII.—"*How far should the Architect receive the Theoretical and Practricvl Training of the Craftsman?*" Resolved: That this Congress considering that the Architect, the master of the works, having under his immediate direction workmen and artisans of the most varied bodies of the State, and utilising the services of the most varied industries, has no means of acquiring in each of these trades and in each of these industries the complete knowledge of a specialist, expresses the desire that the opportunity should be given to the architectural student to acquire in a general but exact manner the technical part of the various trades and industries of the building trade without claiming to practice these trades and industries. It also expresses the wish that between these schools international and continuous relations may be established.

SUBJECT VII.—*This Subject "The planning and laying out of street and open spaces in cities"* was much discussed but no resolution was proposed.

SUBJECT.—VIII.—"*To what extent and in what sense should the Architect have control over other Artists or Craftsman in the completion of National and Public Buildiugs?* Resolution adopted:—That the Architect in the construction of a building should be given absolute power over the co-operating craftsman, but in a special manner over the co-operating artists.

SUBJECT IX.—"*The responsabilities of a Government in the Conservation of National Monuments.*" Resolved:—That in all countries the Government shall be authorized to expropriate a monument possessing historical, artistic or archaeological interest if it is not kept in a due state of preservation by its owner.

SUBJECT X.—"*The Conduct of International Architectural competition.*" Resolution adopted: That the Congress, taking into consideration the reports submitted, recommends them to the examination of the Permanent Committee of the Congress in order that they may submit a special report to the next Congress.

It was further decided to submit the following recommendations to the Permanent Committee: 1.—That the Permanent Committee shall nominate a special commission of seven members who shall study the question of International public competition for the next Congress. 2.—The programme should make clear that the jury shall not and should not have directly or indirectly any material interest in the execution of works put out to competition.

Between session of the Congress excursions in and around Lendon had been organized by the President and the Secretary of the Institute of British Architects, the first being to Hatfield House, 17½ miles from London. The owner, Lord Salisbury, gave us permission to visit every part of this historical residence, which was built between 1607 and 1611. The next place visited was Hampton Court Palace, built by Cardinal Wolsey, who presented it to Henry VIII in 1526.

The following places were also visited by the members of the Congress: Westminster Abbey, Windsor Castle, the residence of the monarchs of England; St. Paul's Cathedral, built in 1675-1697; The Temple, a group of buildings on Fleet street used as law offices; Church of St. Bartholomew the Great at West Smithfield; the Institute of Chartered Accountants, off Moorgate street, a modern building of a very imposing design; the Kensington Palace, where Queen Victoria was born in 1819 and where she held her first Council in 1837; Dorchester House, erected 1853-1854; the Tower of London, the most celebrated fortress of Great Britain; the universities of Oxford and Cambridge; the Victoria and Albert museum; the museum of Natural History; Greenwich Hospital; the Houses of Parliament; the House and Museum of Sir John Soane; and the Tower Bridge.

Arrangements had also been made to visit the famous Doulton's Potteries, Lambeth, and the yards and shops of the great builders Messrs. Holloways, near Victoria Bridge.

On the last day of the Congress a last meeting of the Permanent Committee was held in the rooms of the Royal Institute. I had the honor to be appointed a member of the Board of this Permanent Committee, and M. J. S. Archibald, of Montreal, was appointed a member of the Committee. It was decided that the Eighth International Congress of Architects was to be held in May 1908 in Vienna, (Austria), to coincide with the sixtieth anniversary of the reign of Emperor Francis Joseph, and that some of the meetings of the Congress were to be held in Budapest, (Hungary).

A great number of social functions were held during the Congress week, and I had the honor and pleasure to accept invitations to the following: Reception by the President of the Royal Institute of Royal Architects, at the Grafton Galleries; Soirés at Burlington House, offered by the President and Council of the Royal Academy of Arts; Conversazione at the Mansion House, by kind invitation of the Right Hon. Mayor of London; reception at the Lyceum Club; dinner at Mr. Andrew T. Taylor's residence (a former Montrealer); garden party at Royal Botanic's Gardens, Regents Park, by kind invitation of the President and Council of the Royal Institute of British Architects; a banquet given by the Society of Architects at the Royal Hotel; an evening at the Art Workers' Guild at Clifford Inn Hall and the Farewell Banquet of the members of the Congress in the magnificient Banquet Hall of the Hotel Cecil.

Respectfully submitted,

ALCIDE CHAUSSE,
President of P. Q. A. A.; Architect and Inspector of Buildings.

MONTREAL NOTES.

The Outlook on Mount Royal, though not so far advanced as to permit one to judge perfectly of the effect, has at least got so far that it will in all probability be completed before winter sets in. It is satisfactory to think that this matter, which was taken up and let drop in a vacillating way during so many years, was at last brought to a definite result through the action of the Province of Quebec Association of Architects, who registered their appeal with the city authorities to have such matters put in the hands of men of professional training and experience. This simple proceeding on the part of the association was taken in such good part and acted on so readily by the authorities that one can only hope that the Association will continue to keep its eye on all similar affairs in future, and will be supported therein by all its members and by the public at large. Attention may be called to another scheme which has for a long time been in the same much promised and still unperformed state as once the Outlook was. This is the question of the bridge which it is proposed to erect over the wharves, to enable the passengers to reach the ferry boats without having to cross the railway lines that border the river. This is, no doubt, for more a matter of utility than of appearance only, and differs widely from the case of the outlook; but the question is one of greater importance, and worthy of being treated in a broader manner than seems to be appreciated at present by the city authorities.

In the first place the question is one of safety to life and limb for, although no serious accident may have occurred, the danger is undeniable where thousands of people are daily crossing so many railway lines along a length which has at present no defined limits. In the second place, it is safe to say that all summer long thousands of passengers every day arriving and leaving on ferries and on river and ocean steamers are put to the greatest personal inconvenience, dodging trains and lines of heavy teams or waiting for them to pass,

and finding a path through a wilderness of merchandise of every nature under the land. The simple expedient of a bridge would make a vast improvement to all this; but surely even more can be readily done. An entirely better passenger accommodation on the wharves themselves could be provided in connection with such a bridge, and the stream of passenger traffic could thus be kept more distinct from the freighting, though naturally they cannot be entirely detached. The high level of the streets immediately in rear of Victoria Pier affords a natural opportunity for effecting this separation by means of a bridge. The landing stage at Liverpool, England, gives an example of how a great city can manage to handle its passengers entirely independent of its goods. We are not situated as Liverpool is, but there is much that we can do in this line. Then again not only is the way across the wharfage perilous and disagreeable to pedestrians or to cabs but, once arrived in Commissioner Street, the access to the town is still difficult. "Cabby" seems to prefer St. Francois Xavier Street, apparently because that is the quickest way out of the warehouse district into the professional one. This street is exceedingly narrow and steep and by no means a convenient or impressive entrance to the city. For pedestrians using the ferries, the car line running along the river front is for some reason not one of those on which the service is frequent enough to be convenient. No doubt the passengers arrive largely in great numbers at times which it is impossible, in some cases at least, to foresee precisely. Streams of passengers are always to be seen making their way between Bonsecours Market and the church, and preferring to go as far as Craig Street before taking car. The main reason for this is that the Commissioner Street car route is not one that serves the city conveniently.

All this brings us to the point that the new bridge should be an important one, and should moreover be combined with a scheme of bringing better car service and easier cab access to the succour not only of the much "bechildered" pic-nickers to St. Helen's Island but also of the whole bewildered race of tourists and immigrants. The scheme that is at present in contemplation is apparently nothing more than the erection of a light iron foot bridge over the railway lines, and so far good; let us have that and quickly; but we submit that there is a larger scheme which ought to supersede that within a few years, and it is to be hoped that the P.Q.A.A. Committee on City Improvements will take cognisance of the need, so that we may see the matter taken up in a way that will do the city credit from an architectural point of view. Suggestions have been made on the part of the shipping interests of the port, that engineering specialists should be called on to draw up a report on the best means of improving the shipping accommodation and conveniences. This is, no doubt, for the benefit of trade, but passengers also are making more and more demands on the river. Both above and below the city the banks are becoming more and more occupied with village and country houses. The ferries, therefore, call for increased conveniences too. So far passengers have received a somewhat rough handling, and, unless the city looks after their interests, they stand the same chance of being made to take a place quite secondary to mere "goods."

An evening paper has been making a stir with regard to the amount of builder's material which is at present obstructing sidewalks and streets in various parts of the city. Strictures on this matter are very much in order there is no doubt the man in the street fares badly. In commenting on the matter, however, it is customery to assume that this disposal of material is a gratuitous piece of insolence on the part of the builder, who is pictured as a ruffian who spends his time devising inconveniences to annoy the public. The system of paying for so much of the street to dump material on is, if not expressly provided for in the city by-laws, at least in practice acted up to systematically by builders and city authorities alike. Let the authorities improve their by-law and see that they are enforced and no doubt the building will submit to the improved arrangement, even if he has to adjust his prices accordingly.

We are threatened with another big hotel. We are treated to so many schemes for big hotels that we begin to become indifferent to the glowing word pictures of them which appear in our newspapers. They are flaunted before us with every particular of luxury and of cost. They are designed regardless of expense, and with every aid to living that can be suggested by a mind unable to conceive of any life beyond such as may be lived in New York. They fix upon a local habitation and a name, as often as not they vanish into thin air, being of such stuff as dreams are made of. This latest vision is described as occupying the side of Dominion Square, extending from the Y. M. C. A. building, we know not how far in the direction of St. Catherine Street. The cost is is to be $1,000,000 "or so." We could really be doing with one or two more nice hotels of stone and lime as, during the past summer, accommodation was short and people had to sleep in railway cars in the stations, anything tangible being better than a vision in these cases.

The expropriation of the Amherst Farm has added a new park to the city. The actual expropriation includes the whole district bounded by the C. P. R. tracks, Papineau avenue, Mount Royal avenue and St. Davis street. Within this district is be formed a public park to be known as the Cremazie Park. The total cost is $16,837.20, of which half is paid by the city and half by the proprietors in the immediate neighborhood.

The McGill University Students Union building is now completed, and was opened for the use of students on the first of October.

It is announced that the Morgan Cement Works at Longue Pointe have become the property of a strong syndicate which has the intention of putting plant down to turn out 600,000 barrels per year, with a view also of eventually increasing the output to double that figure.

We are promised a new jail, at the cost of about $1,000,000, to be built on the Back river and to be commenced next spring. This it is said, is to be arranged on the most modern principles and adequate to meet the wants of a quarter of a century hence. One million dollars plus the cost of our police system is quite a fairish sum to hand over to keep ourselves from being robbed.

The assessed valuation of the city for the current year is placed at $202,214,805, or an increase of twenty millions over last year. More than fifty million dollars worth is included in exemptionsf rom taxation.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

From "Subscriber."—I have a stone cellar built under a house, but find that water gets in through the walls, please advice me as to how I can prevent water getting through the walls.

ANSWER.—It you cannot drain the water away from the outside, it will be difficult to keep the water out. A good way, but rather expensive is to lay a concrete floor not less than six inches deep all over the cellar area, then carry a six inch concrete wall up against the stone walls, a few inches above high water mark. Water can not get through the concrete if it is well and properly made and well tamped in its place. The top of the concrete wall could be used for a shelf if required. Plastering with cement or daubing over with asphalt will be useless expense as neither one or the other will keep out the water if applied to the inside walls.

From "E. J."—I would like very much if there were more practical matter in "THE CANADIAN ARCHI-

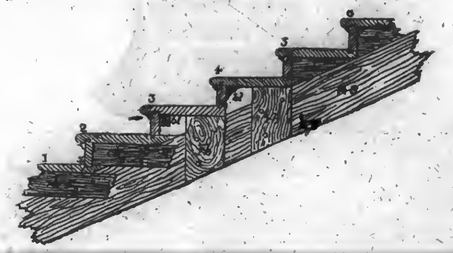


FIG. 1.

builders. It is all right for architects and draftsmen, and is, no doubt, a lot of good for them. Will you please answer the following questions and oblige? How can I support a stairway with winders making a half sweep whole opening about 7 feet 5 inches; the wellhole being 13 inches. Also how can I find the lengths and bevels for valley rafters and cripples or jacks, when two roofs having unequal pitches join?

ANSWER.—We note what "E. J." says regarding more "practical matter" and will consider the subject. With regard to making rough stringers or bearers for carrying a flight of stairs around a half spacem we may say there are several methods of doing this work. In this country the rough bearers are put up the same as a rough string without being cut to fit snug against the riser and the tread and then nailed to the rough string. These will carry the stairs even if there was no outside strings. The diagram shown at Fig. 1, gives a good idea of the manner of doing this work. It will be noticed that three different methods are shown, under treads 1 and 2, the pieces or brackets are nailed to the rough strings parallel to the tread, while under risers 3 and 4 the pieces are nailed at right angle to the tread and at 5 and 6 the pieces are cut triangular and sit on the top of the rough string to which they are nailed. Fig. 2 shows how the rough strings may be placed. Those marked s are placed at the angle or pitch of the stair, and butt against the trimmers A A. A rough well may be put in position and the short strings X X X cut in against the well and the wall to suit the angles required. Cripples O O O should be cut in as shown, and the whole may be made strong enough to carry an elephant. Fig. 3 shows how a bent string for your finished well-hole

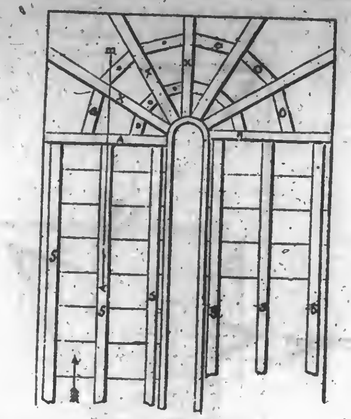


FIG. 2.

may be formed by bending thin veneers around a cylinder glueing them together one over the other until the required thickness is obtained. For getting the bevels and lengths for valley rafters and cripples where the roof has unequal pitches, we give you Hodgons' rule as laid down in his work on "The Steel Square."

Fig. 4 is a plan for framing a valley in a roof where one side is much steeper than the other, as for instance,

FIG. 3.

one side rises, say 10 feet in 8 feet. 1-1 is the wall line; 2-2 is the ridge line; 3-3 is the valley rafter; 4 is the bevel at the foot; 5 is the bevel at the head; 6 is the bevel of the jacks on the lowest pitch, also the lengths of same; 7 is the bevel of and length of jacks on the steep side; 9 is common rafter on the lower pitch; 10 is the down bevel on jacks of each side; 11 is the height of roof; 12 is the base line of valley.

The rafters will not match on the valley as on an equal-pitch roof. It will be seen that it will take seven jacks on the steep side, while it requires only four on the other side, but the bevels will all fit.

From "Contractor."—Will you kindly describe and illustrate a good method of laying a solid Portland cement sidewalk and show cuts of tools required for the purpose?

ANSWER.—In laying a cement walk the first of all the ground should be excavated to subgrade and well

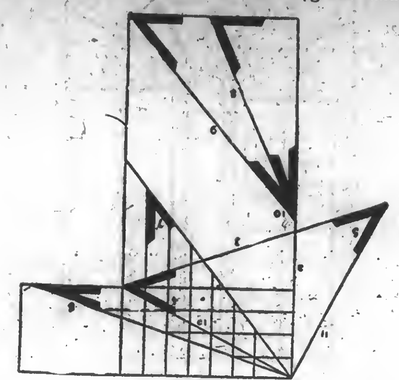


FIG. 4.

consolidated by ramming to prepare it for the subfoundation of stone, gravel or cinders. The depth of the excavation will depend up the climate and nature of the ground, being deeper in localities where heavy frosts occur or where the ground is soft than in climates where there are no frosts. In the former case the excavation should be carried to a depth of 12 inches, whereas in the latter from 4 to 6 inches will be sufficient. No roots of trees should be left above subgrade. The subfoundation consists of a layer of loose material, such as brocken stone, gravel or cinders,

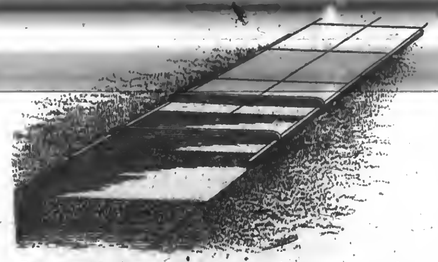


FIG. 5.—DETAILS OF CONCRETE WALK CONSTRUCTION.

spread over the subgrade and well tamped to secure a firm base for the main foundation of concrete, which is placed on top. It is most important that the subfoundation be well drained to prevent the accumulation of water, which, upon freezing would lift and crack the walk. For this purpose it is well to provide drain tile at suitable points to carry off any water which may collect under the concrete. An average thickness for subfoundation is 4 to 6 inches, although in warm climates, if the ground is firm and well drained, the subfoundation may be only 2 to 6 inches thick or omitted altogether.

The foundation consists of a layer of concrete deposited on the sub-foundation and carrying a surface layer or wearing coat of cement mortar. If the ground is firm and the sub-foundation will rammed in place and properly drained great strength will not be required of the concrete, which may be in such cases mixed in about the proportions 1-3-6, and a depth of only 3 to 4 inches will be required. Portland cement

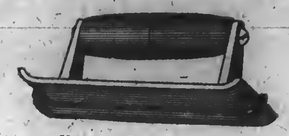


FIG. 6.—JOINTER USED IN DIVIDING WALK INTO SECTIONS.

should be used and stone or gravel under 1 inch in size, the concrete being mixed of medium consistency so that moisture will shoe on the surface without excessive tamping.

To give a neat appearance to the finished walk, a top dressing of cement mortar is spread over the concrete, well worked in and brought to a perfectly smooth surface with straightedge and float. This mortar should be mixed in the proportion 1 part cement to 2 parts sand, sharp, coarse sand or screenings be-

FIG. 7.—TOOL USED IN ROUNDING EDGES.

low ¼ inch of some hard, tough rock being used. The practice of making the concrete of natural cement and the wearing surface of Portland is not to be recommended, owing to a tendency for the two to separate

A cord stretched between stakes will serve as a guide in excavating after which the bottom of the trench is well consolidated by raming, any loose material below subgrade being replaced by sand or

FIG. 8.—ROLLER USED IN FINISHING SURFACE.

gravel. The material for the subgrade is then spread over the bottom of the trench to the desired thickness and thoroughly compacted. Nest stakes are driven along the sides of the walk, spaced 4 to 6 feet apart, and their tops made even with the finished surface of the walk, which should have a transverse slope of ¼ inch to the foot for drainage. Wooden strips at least 1½ inches thick and of suitable depth are nailed to these stakes to serve as a mold for the concrete. By

carefully adjusting these strips to the exact height of the stakes they may be used as guides for the straightedge in levelling off the concrete and wearing surface. The subfoundation is well sprinkled to receive the concrete, which is deposited in the usual manner, well tamped behind a board set vertically across the trench, and leveled off with a straightedge, as shown in Fig. 1, leaving ½ to 1 inch for the wearing surface. Three-eighths inch sand joints are provided at intervals of 6 to 8 feet to prevent expansion cracks, or, in case of settlement, to confine the cracks to these joints. This is done either by depositing the concrete in sections or by dividing it into such sections with a spade when soft and filling the joint with sand. The location of each joint is marked on the wooden frame for future reference.

Care must be exercised to prevent sand or any other material from being dropped on the concrete, thus

A NOVEL HOUSE-MOVING.
A large residence, about 35 x 50 feet, two stories high, moved on two large lighters a distance of two miles at Dalhousie, N. B., last all. Owned by W. S. Montgomery, President and Manager of the Restigouche Woodworking Company. The lighters were towed by a gasoline launch and the by inoving water was completely successful, though novel.

preventing a proper union with the wearing surface. No section should be left partially completed to be finished with the next batch or left until the following day. Any concrete left after the completion of a section should be mixed with the next batch.

It is of the utmost importance to follow up closely the concrete work with the top dressing in order that the two may set together. This top dressing should be worked well over the concrete with a trowel, and leveled with a straightedge, as shown in Fig. 5 to secure an even surface. Upon the thoroughness of this operation often depends the success or failure of the walk, since a good bond between the wearing surface and concrete base is absolutely essential. The mortar should be mixed rather stiff. As soon as the film of water begins to leave the surface a wooden float is used, followed up by a plasterers trowel, the operation being similar to that of plastering a wall. The floating, though necessary to give a smooth surface, will if continued too long, bring a thin layer of neat cement to the surface and probably cause the walk to crack.

The surface is now divided into sections by cutting entirely through, exactly over the joints in the concrete. This is done with a trowel guided by a straightedge, after which the edges are rounded off with a special tool called a jointer, having a thin shallow tongue, as shown in Fig. 6. These sections may be subdivided in any manner desired for the sake of appearance.

A special tool called an edger, Fig. 7, is run around the outside of the walk next to the mold, giving it a neat rounded edge. A toothed roller, shown in Fig. 8 and having small projections on its face, is frequently used to produce slight indentations on the surface, adding somewhat to the appearance of the walk. The completed work must be protected from the sun and kept moist by sprinkling for several days. In freezing weather rhe same precautions should be taken as in other classes of concrete work.

Two well-known men about town were discussing a new club-house which had recently been built at great cost. One of the men had just been inspecting the new building.

"What style did you say it was decorated in?" asked the other.

The man who had seen the interior reflected a moment. "I think it was either Late Pullman or Early North German Lloyd," he replied.—*Harper's Weekly.*

The rafters will not match on the valley as on an equal-pitch roof. It will be seen that it will take seven jacks on the steep side, while it requires only four on the other side, but the bevels will all fit.

From "Contractor."—Will you kindly describe and illustrate a good method of laying a solid Portland cement sidewalk and show cuts of tools required for the purpose?

ANSWER.—In laying a cement walk the first of all the ground should be excavated to subgrade and well

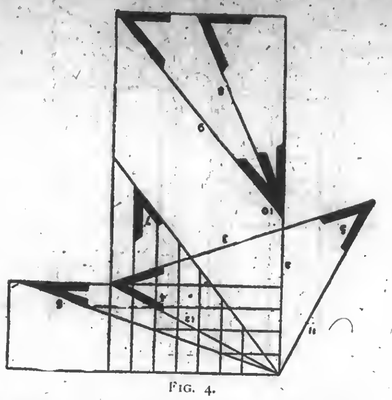


FIG. 4.

consolidated by ramming to prepare it for the subfoundation of stone, gravel or cinders. The depth of the excavation will depend up the climate and nature of the ground, being deeper in localities where heavy frosts occur or where the ground is soft than in climates where there are no frosts. In the former case the excavation should be carried to a depth of 12 inches, whereas in the latter from 4 to 6 inches will be sufficient. No roots of trees should be left above subgrade. The subfoundation consists of a layer of loose material, such as brocken stone, gravel or cinders,

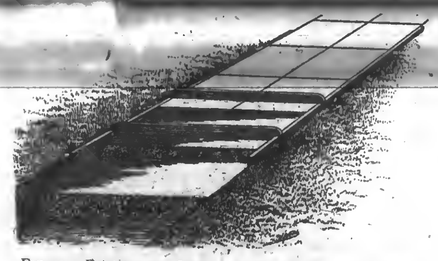


FIG. 5.—DETAILS OF CONCRETE WALK CONSTRUCTION.

spread over the subgrade and well tamped to secure a firm base for the main foundation of concrete, which is placed on top. It is most important that the subfoundation be well drained to prevent the accumulation of water, which, upon freezing would lift and crack the walk. For this purpose it is well to provide drain tile at suitable points to carry off any water which may collect under the concrete. An average thickness for subfoundation is 4 to 6 inches, although in warm climates, if the ground is firm and well drained, the subfoundation may be only 2 to 6 inches thick or omitted altogether.

The foundation consists of a layer of concrete deposited on the sub-foundation and carrying a surface layer or wearing coat of cement mortar. If the ground is firm and the sub-foundation will rammed in place and properly drained great strength will not be required of the concrete, which may be in such cases mixed in about the proportions 1-3-6, and a depth of only 3 to 4 inches will be required. Portland cement

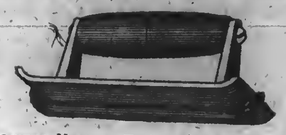


FIG. 6.—JOINTER USED IN DIVIDING WALK INTO SECTIONS.

should be used and stone or gravel under 1 inch in size, the concrete being mixed of medium consistency so that moisture will shoe on the surface without excessive tamping.

To give a neat appearance to the finished walk, a top dressing of cement mortar is spread over the concrete, well worked in and brought to a perfectly smooth surface with straightedge and float. This mortar should be mixed in the proportion 1 part cement to 2 parts sand, sharp, coarse sand or screenings be-

FIG. 7.—TOOL USED IN ROUNDING EDGES.

low ¼ inch of some hard, tough rock being used. The practice of making the concrete of natural cement and the wearing surface of Portland is not to be recommended, owing to a tendency for the two to separate

A cord stretched between stakes will serve as a guide in excavating, after which the bottom of the trench is well consolidated by raming, any loose material below subgrade being replaced by sand or

FIG. 8.—ROLLER USED IN FINISHING SURFACE.

gravel. The material for the subgrade is then spread over the bottom of the trench to the desired thickness and thoroughly compacted. Nest stakes are driven along the sides of the walk, spaced 4 to 6 feet apart, and their tops made even with the finished surface of the walk, which should have a transverse slope of ¼ inch to the foot for drainage. Wooden strips at least 1½ inches thick and of suitable depth are nailed to these stakes to serve as a mold for the concrete. By

carefully adjusting these strips to the exact height of the stakes they may be used as guides for the straightedge in levelling off the concrete and wearing surface. The subfoundation is well sprinkled to receive the concrete, which is deposited in the usual manner, well tamped behind a board set vertically across the trench, and leveled off with a straightedge, as shown in Fig. 1, leaving ½ to 1 inch for the wearing surface. Three-eighths inch sand joints are provided at intervals of 6 to 8 feet to prevent expansion cracks, or, in case of settlement, to confine the cracks to these joints. This is done either by depositing the concrete in sections or by dividing it into such sections with a spade when soft and filling the joint with sand. The location of each joint is marked on the wooden frame for future reference.

Care must be exercised to prevent sand or any other material from being dropped on the concrete, thus

A NOVEL HOUSE-MOVING.
A large residence, about 35 x 50 feet, two stories high, moved on two large lighters a distance of two miles at Dalhousie, N. B., last fall. Owned by W. S Montgomery, President and Manager of the Restigouche Woodworking Company. The lighters were towed by a gasoline launch and the by moving water was completely successful, though novel.

preventing a proper union with the wearing surface. No section should be left partially completed to be finished with the next batch or left until the following day. Any concrete left after the completion of a section should be mixed with the next batch.

It is of the utmost importance to follow up closely the concrete work with the top dressing in order that the two may set together. This top dressing should be worked well over the concrete with a trowel, and leveled with a straightedge, as shown in Fig. 5 to secure an even surface. Upon the thoroughness of this operation often depends the success or failure of the walk, since a good bond between the wearing surface and concrete base is absolutely essential. The mortar should be mixed rather stiff. As soon as the film of water begins to leave the surface a wooden float is used, followed up by a plasterers trowel, the operation being similar to that of plastering a wall. The floating, though necessary to give a smooth surface, will if continued too long, bring a thin layer of neat cement to the surface and probably cause the walk to crack.

The surface is now divided into sections by cutting entirely through, exactly over the joints in the concrete. This is done with a trowel guided by a straightedge, after which the edges are rounded off with a special tool called a jointer, having a thin shallow tongue, as shown in Fig. 6. These sections may be subdivided in any manner desired for the sake of appearance.

A special tool called an edger, Fig. 7, is run around the outside of the walk next to the mold, giving it a neat rounded edge. A toothed roller, shown in Fig. 8 and having small projections on its face, is frequently used to produce slight indentations on the surface, adding somewhat to the appearance of the walk. The completed work must be protected from the sun and kept moist by sprinkling for several days. In freezing weather the same precautions should be taken as in other classes of concrete work.

Two well-known men about town were discussing a new club-house which had recently been built at great cost. One of the men had just been inspecting the new building.

"What style did you say it was decorated in?" asked the other.

The man who had seen the interior reflected a moment. "I think it was either Late Pullman or Early North German Lloyd," he replied.—*Harper's Weekly.*

THE EXTERMINATION OF THE MOSQUITO*

Through the courtesy of the Island Association I am with you to-night for the purpose of laying before you some facts connected with an important reform which is gathering considerable headway in the States and other parts of the world, and is giving some excellent proofs of its entire practicability. I am constructively addressing his Worship the Mayor and Members of the City Council and other Officials invited, who may or may not be present; assuming that what may be said or done in this meeting will come to their attention, through resolution or otherwise. I may say that your Mayor has shown an interest in the movement by his attendance at a preliminary luncheon conference at the Club yesterday, and has expressed himself as willing to do anything in his power to forward the desired object for which we are assembled. And as desirable as any City action that may be taken it is of equal or greater importance that the authorities of the Province should be enlisted in the good cause; for the subject is coming to be considered to be an equal obligation upon the City as are those of roadmaking and like public improvements,

We of the states consider our brethern on the North as so closely related to us that we are very willing to give them any suggestions in lines of work which we may have taken up, assuming that you would gladly reciprocate. We think the reform so important that a number have formed an association having for its object the distribution of literature on the subject, the obtaining of necessary laws to carry out the reform and the aid in spreading the reform in every possible way. So firmly has the desirability of the movement appealed to us that many are giving of their private funds and very largely of their time to support our campaign of education. The society for which I am Secretary has been in existence about 3 years and expended its first year about $1000. to carry on the propoganda. Finding that others besides those within the limits of the States desired information and to join the Society, it was decided to adopt the name "American" rather than "National"; in order that all in every part of the Americas would be free to join. Our correspondence runs extensively throughout the Americas, from Assiniboia in the North to the West Indies and Districts in South America; so that the people of Toronto may feel that they are interested in the society as properly as are any others.

In our first epoch we meet what every reform must meet and pass through, the period of ridicule, but we are glad to say that as the press and people have oecome enlightend on the subject, ridicule has turned to cordial endorsement and co-operation, except in very rare instances in a certain class of papers.

I am going to assume that you are informed fully enough on the wonderful proofs as to the dangerous character of certain [illegible] mosquitoes give to property and other interests in any community in which they prevail. I can in a word say that the demonstrations of the scientists of the connection between mosquitoes and malaria have never been excelled in clearness of proof; and what has been shown of malaria has been shown to be true of yellow tever, though that interests this Northern section only indirectly. An eminent writer has recently said of malaria that in his section it is responsible for more losses than any four diseases with which they are afflicted. And when we consider that it is not alone the deaths that occur from malaria, but the lessening of the vital forces of the section, we can readily believe this claim will apply to any section of the Western hemisphere. The other interests which are affected by this evil, while on a different plane from that of health, are of themselves very important. Whole sections of beautiful country are practically unpopulated through the agency of the mosquito; property values are lessened, and a general decrease in all interests results. I recall the fact of a very large hotel in an attractive country being this year closed, the large plant remaining unproductive, entirely on account of the prevalence of mosquitoes; and this is only one instance of many that exist.

I am going to assume also that you are so well satisfied that the mosquito is a nuisance that you are ready to co-operate in any movement which can be shown to be a practical remedy, and I shall therefore refer to a number of points that show what may be expected of the reform and what other people think of investing in it. And in this recital I shall have to be somewhat personal. Having always lived where mosquito producing marshes were common, my mind rao to the thought of the utilization of these waste areas. About a quarter of a century ago the United States Government took up the matter of having a report made of the coast marshes of the country, and examinations were made from Maine to Texas and along the Pacific borders of the States. On a few points where reclamations had been made for agricultural purposes the report not only showed the great value of this improvement but casually mentioned in some instances that mosquitoes were eliminated. It was this report that gave me the first thought of the desirability and practicability of drainage for mosquito extermination. During the intervening years the thought has gained strength, for in this was the true solution of the question. And when many years ago the theory was announced and afterwards so clearly proven by Major Ross, a doctor in the English army, that malaria was the result of a bite of an inoculated mosquito, our cause gained a great impetus. The use of oil for this purpose is conceded to be only a temporary remedy and it is now acknowledged that to drainage we must look for the solution of all the evils which attend the prevalence of mosquitoes.

It has taken some years of work to lead up to public action, but this we are now obtaining in many places in the States and abroad. When action was first started to secure Legislation in the State of New Jersey it was met with persistent ridicule, but, after the expenditure of some $10,000 in preliminary investigation and experiments on a small scale, the results were so encouraging that now that State has appropriated $350,000, to be expended in a series of years in the drainage of wet lands, and the State is not even considering the benefits to agriculture. In New York State we have been working for an initial $5,000 with which to make a start, but so far have failed owing, as I am informed, to the fact that the Committee having charge of such matters have thought that public opinion was not sufficently enlightened on the subject to justify the expenditure of any money. In the same State when a Bill was introduced in the Legislature by a Member, making the drainage of breeding areas possible, he was laughed to ridicule; but so thoroughly did we inform the next Legislature that when the Bill again came up it was passed without dissent, and now the State of New York has a law which we commend to your consideration, by which any water found to be breeding mosquitoes may be declared a nuisanre by the local board of health, and provision is made for getting rid of it. While these two States are farthest advanced in this legislation, others have already taken up the subject or are preparing to do so. In a little town on the New England Coast, almost entirely supported by Fisheries, one of our members, a summer resident, became interested in the subject of extermination, procured our literature and started [illegible] The work was mainly the spreading of oil over the breeding places and this was so successful that the little town voted about $800 a year for some 3 years for this work. Finding that it was not reaching the root of the matter, they asked the Secretary to visit them and inspect the situation; which he did last year, and the result of the public meeting and action which has since been taken is that the Legislature of that State has authorized this humble community to appropriate the sum of $20,000 in work recommended to them.

As I have said before this matter of Legislature has only been brought about by the expenditure of private funds in large amounts. About 3 years ago one progressive gentleman underwrote a certain movement to the extent of $10,000, and, though his death prevented the carrying forward of the work, at the close of the first season persons who had been residents of the section for 25 years testified that there had never been a season in all their residence there when there had been less mosquitoes. And that movement has resulted in the spread of the importance and desirability of action.

Another section has been spending $1,000 a year for about 5 years in draining its marshes, meanwhile using oil; and, though exposed on every side, it has shown that this work is most important and successful; so much so that there is now no difficulty in securing the votes for the annual appropriation. There are communities in New Jersey which spent large sums of money in local successful work before the State took up the matter at all, and are still doing this work with most gratifying results.

Many sections are having their territory examined to ascertain the possibility of relief, and this is occurring in various States.

The first large movement was that in the territory around Oyster Bay, on the North shore of Long Island, in which the speaker was retained as engineer.

Like almost every movement since, that was started at a dinner conference and some $3000 or $4000 was subscribed by individuals with which to carry on the movement. Surveys were made, work was begun and, on account of the progress of breeding, oil was used in some instances during the succeeding summer. This initial work was on an island in Oyster Bay known as Centre Island. Many costly houses had been erected here, and vast sums of money spent in improvements, including an elegant club house for the Seawanhata-Corinthian Yacht Club; and this in the face of the fact that it was acknowledged that few, if any, places excelled the island in its output of mosquitoes. By rapid work we anticipated the breeding while the work of drainage was going on, and at the end of that season the Treasurer of the Committee, a prominent New York banker, wrote me that never before had the islanders been able to enjoy their their lawns and piazzas in the evenings. And places adjacent the marshes, which were said to have been almost impassable on account of mosquitoes, were entirely freed from them. I was there this summer, and it was told to me, by those who had been there during the intervening years, that the good results were continued up to this time. During the work my opinion was asked as to the value of the marshes which we were operating on, and I stated that $10 an acre would be a fair price for them; but, when we had completed our work and the results had been shown, an owner was asked by one desiring to purchase some of the marshes to put a price on them; it was $3000 an acre. The values on the island I am informed have steadily increased, and this we hold will be the case in all communities successfully carrying out this class of work. A territory of about 75 square miles was gone over by me and reported upon, and the work on this island was only a part of that recommended for the larger territory. This report involved another private expenditure of some thousands of dollars, illustrating the progressiveness of that community.

You are doubtless familiar with the work done at Havana in exterminating yellow fever. For two centuries that dread disease had been endemic at Havana and, after the discovery of the germ of this disease by a commission of surgeons, work was begun to rid the city of mosquitoes, and the first time it was there for many months after the U. S. army left was when the Cubans themselves relaxed their efforts. Something like $100,000 was spent in mosquito work alone by the United States army. Work by the same physician, who is one of the members of the Advisory Board of our society, is now going on in the Isthmus of Panama, and already a million dollars has been expended on it, with the result that the Health Offi[illegible] shows that the large forces of workers and the army are as healthy as they would be working in almost any part of the United States.

Now all this is the prelude to what I want to say as to your situation here on the island, as far as I have been able to examine it. You are of course absolutely free from the great peril of the salt water marsh mosquito, but you are not free from the malaria breeders or others which cause great annoyance and discomfort, as well as depreciation of values. These are inherent in the island here, so convenient to your beautiful city. The isolated character of your situation as an island would make the work done here to be entirely unaffected by surrounding exposures. I have not examined a wide enough territory in the city to know whether, if you should free the island from mosquitoes, you would get any output from the main land but my impression is that you would not.

I consider that a thorough scheme of work carried on here would be quite beyond what might be called an experiment. Indeed I feel assured that the island can be absolutely freed from mosquitoes and what that means to you in all respects you are able to judge as well as the speaker.

*A paper read by Professor Henry Clary Weeks, of New York, before the Toronto Island Association.

LOW SUMMER TOURIST RATES WEST.

During the entire summer the Chicago and North Western Railway will have in effect very low round trip tourist rates to Colorado, Utah, California, Oregon, Washington and British Columbia points. Choice of routes going and returning with favorable stop-overs and time limits. Very low excursion rates to the Pacific Coast from June 25th to July 7th. For further particulars, illustrated folders etc., write or call on B. H. Bennett, General Agent, 2 East King Street, Toronto, Ont.

CANADIAN ARCHITECT AND BUILDER COMPETITONS.

It is proposed to have three competitions for students and draughtmen, as described below, with prizes for each competition, and the conditions that the CANADIAN ARCHITECT AND BUILDER may reproduce for the benefit of its subscribers the designs of the prize-winners in each competition.

The intention is to offer suggestions of good design for the use of builders and others in the country, who erect buildings without consulting an architect.

Each drawing to be accompanied by a brief description of the material intended to be used.

Both drawings and description are to be signed with a *nom de plume*, and the same *nom de plume* is to be written on a sealed envelope which contains the competitor's name and address.

The drawings must be made in line for reproduction, and arranged within a rectangular border with sides in the proportion of 7 to 10. If drawn large, the lettering should be large in proportion, so as to be legible when the drawing is reduced to the size of the reproduction, which will be 7 inches by 10 inches. The scale must be drawn, not merely noted.

COMPETITION I. Drawings to be delivered at the office of the CANADIAN ARCHITECT AND BUILDER, Confederation Life Building, Toronto, on or before the 1st of December next.

This competition will repeat the theme of a small house in a country town. The cost to be between $2,000, and $3,000, exclusive of land. The lot will be supposed to be 50 feet wide by 150 feet deep, on a residential street in which the houses are set back 30 feet from the line of the lot upon the street. The house may be suppnsed to face any of the cardinal points of the compass; but must be planned to suit the particular aspect selected, and will be judged according to the manner in which this prime requisite of house-planning is treated.

There will be two sheets of drawings required in this competition. One will contain the plans and elevations and the other will contain certain details.

The drawings required are: plans of the ground and first floor, elevations of three sides, and a perspective in which the fourth side will be shown.

The ground floor plan must show the laying out of the grounds as much as space will permit, and must have drawn upon it a diagram showing the points of the compass.

The sheet of details must show the porch, main eaves and gable, (if there is a gable), drawn to a scale large enough to show the construction, and giving sectional details to a still larger scale.

[illegible] first prize, $20; second $15; third, $5; fourth, a year's subscription to the CANADIAN ARCHITECT AND BUILDER.

COMPETITION II. Drawings to be delivered at the office of the CANADIAN ARCHITECT AND BUILDER on or before the 1st of January, 1907.

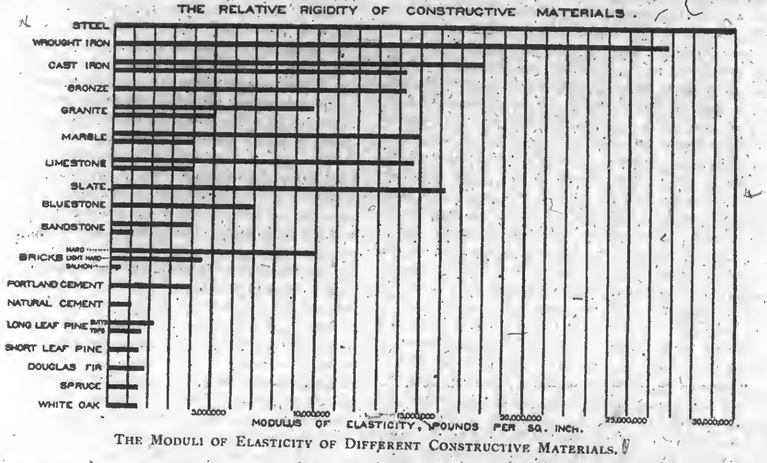
The subject is a farmhouse. There will be one sheet of drawings, similar to that required for competition 1; that is to say a sheet containing, within a 7 x 10 border, ground and first floor plans, three elevations, and a perspective showing the fourth side; but, in this case, as the cellar of a farmhouse is used for storage, there must be also a plan of the cellar; drawn on a separate piece of paper, so that it may be reproduced separately for insertion in the text.

There is no definite cost fixed; but there must be a limit. Houses quoted in the *Farmers' Advocate* (which, as well as other farming journals, is recommended for consultation), range in cost from $1600 to $4500. A house of the former price was 31 ft. by 37 ft. The $4500 house is a well built frame house, on a stone foundation, and measures 26 ft. by 54 ft. in the main part with an 18 ft. x 36 ft. wing, the greater part of which is shed. This is an unusually good house with brick cellar walls, open fireplaces in the living rooms, bathroom with water supply, and in all respects well appointed. This scale of excellence seems to be above the ordinary, while that of the $1600 house is hardly sufficient for what is now recommended. It will probably be safe to rate the cost of such a house as is now wanted at about $2.00 per square foot on the ground. Competitors may plan for any size between the limits of $2,000 and $4,000. We want houses of different sizes: and the plans will be judged not according to size but according to merit within the size adopted. It must be remembered, however, as regards size, that compactness is a great gain where there are no household servants; and

an unnecessary scale of accommodation, for dignity rather than comfort, is no merit in a design for an ordinary Canadian farmhouse. The first intention should be to save steps; not by squeezing to such an extent that the inconveinence of huddle takes the place of the inconvenience of oversize; but by a compactness of arrangement that will make the service department—dining room, kitchen, pantry, summer kitchen and woodshed—touch upon one another without intervening passages to traverse and keep clean, and, in general, throughout the house, will serve comfort by giving, as far as possible, exactly the space required for comfort—not less, but certainly no more. Waste spaces that require defence indicate the need for further study of the plan.

So far there is not much difference between a farmhouse and another dwelling, except that the kitchen must be a room of good size. But there are some special points to be considered.

The modern farm house is equipped with the appliances for water drainage. A septic tank with subsoil discharge can be built for a $100 or so, and is to be assumed as the method of drainage; so that the house will be equipped with the conveniences of an ordinary bathroom. But water supply varies, and it will be best to consider that the only dependence is upon rain water from the roof. For this reason there is usually a cistern



THE MODULI OF ELASTICITY OF DIFFERENT CONSTRUCTIVE MATERIALS.

room in the cellar with a tank from which water is drawn by a pump in the kitchen. To get water in the bathroom there may be either a bathroom cistern filled by a force pump, or the roof water may be led first to the bathroom cistern and overflow to the tank in the cellar. In either case one would think there is [illegible] reason why the bathroom should be on the bedroom floor. The morning bath is not in vogue in farm houses. After the day's work is over, and in the leisure of the evening is a much more serviceable time for this ceremony. A bathroom adjacent to the kitchen will make the supply of both hot and cold water easier. It might open off a back vestibule, which will be needed so that the men can take off their dirty boots before coming into the house. To have washing arrangements here also will be a good thing. It is not, however, intended to dictate the plan in this respect.

Besides the tank room the cellar will require subdivisions for a furnace and fuel, for vegetables, for fruit, and for milk. There ought to be a special entry to the cellar for this produce, and it might conveniently be the woodshed, (which in combination with the summer kitchen usually makes a one-storey wing in the rear). If, as is usual, the wood shed is beyond the summer kitchen and the depth of the summer kitchen has to be passed to reach the cellar, the situatton invites to the convenience of an inclined plane.

These suggestions are not intended to give a complete account of the requirements of a farm house, but rather to suggest that the subject requires some study. This is best done, for those who are not in touch with farming life, by looking through a volume or two of a good Agricultural journal.

As to design, simplicity is of course necessary. The house will be more economical to build, to keep and to use, if it is simple in form. But there is no occasion to despair of its appearance on this account. A small building, on such a spacious site as a farm, ought not to have its mass much cut up. There is sure to be, in the summer kitchen, a minor mass that will take care of composition in the rear. The entrance front will have its necessary appendage in the way of porch, verandah &c.; and, an isolated building is always the better for having the entrance marked by something in the upper part of the building which expresses its position.

The prizes for this competition will be:—First prize, $15.00; second, $5.00; third, a year's subscription to the CANADIAN ARCHITECT AND BUILDER.

COMPETITION III. To be delivered at the office of the CANADIAN ARCHITECT AND BUILDER on or before the 1st of February, 1907.

The subject is a shop front for a shop such as is usually occupied by a grocer, druggist, hardware merchant, &c.

The building will have light on front and back only. It will have a frontage of 25 feet, in which must be included a separate entrance for a dwelling above the shop. The floor plans of the dwelling must be given on a separate sheet of paper, so as to be reproduced separately on a small scale, for insertion in the text. What is required on the drawing sheet is only—an elevation of the whole front, to a scale of 8 ft. to an inch; a plan through the shop window to a scale of 4 ft. to an inch; and details of the shop window to a scale of 1 ft. to ¾ in. The whole to be arranged within a border with sides having the proportions of 7 to 10.

The prizes for this competition are:—First prize $15.00; second, $5.00; third, a year's subscription to the CANADIAN ARCHITECT AND BUILDER.

THE RIGIDITY OF CONSTRUCTIVE MATERIALS.

The relative rigidity of the materials of construction, as shown by their moduli of elasticity, is exhibited on the accompanying diagram and the table of numerical values furnished by James E. Howard, of Watertown, Mass. The data used in their preparation are from the results of tests made at the Watertown Arsenal, although some of the data might, of course, be had from many other [illegible]

Does it pay to eat, drink and sleep? You have to. Does it pay to advertise? 'Tis the "eat and drink" of business. You can't live on sleep alone.

ONTARIO ASSOCIATION OF ARCHITECTS.

STUDENTS' CLASSES.

The Mathematical Classes will be resumed in the rooms of the O. A. A., 96 King St. West, on Monday, October 22nd, at 8 p. m.

Mr. Thomas Taylor, graduate of the School of Practical Science and now on the Engineering Staff of the Canada Foundry Co., will have charge of these classes.

Arrangements are now being made for lectures and classes in other departments of the Curriculum, announcement of which will be given later

The fees for the full course up till March, 1907, will be Five Dollars, payable in advance to the Secretary-Treasurer.

9 Yonge St., Toronto.
Oct. 16th, 1906.

A. H. GREGG,
Sec-Treasurer.

HAVE you seen my

ART GLASS?

Can you beat it?

MEMORIAL WINDOWS

H. E. ST. GEORGE,
74 Fullerton Street, LONDON, ONT.

COMPETITION FOR ADVERTISEMENT DESIGNS.

We wish to make the advertisement pages of the CANADIAN ARCHITECT AND BUILDER an artistic collection of attractive designs, each telling its own tale and irresistibly drawing the attention of readers to the articles advertised in an effective and artistic way.

With this object we invite competitive designs suitable for advertising the goods of any firm advertising in the CANADIAN ARCHITECT AND BUILDER. Competitors may base their ideas on an advertisement already appearing, or they may put themselves in communication with an advertiser with a view to finding out what he would like to emphasize in his advertisement.

Competitors may send in one or more designs, and may exercise their own discretion as to the size of the same. Each, however, must be suitable for reproduction as either a full, half, or quarter-page of the CANADIAN ARCHITECT AND BUILDER (the dimensions of which can be easily ascertained by a reference to advertisements at present appearing), and should be drawn 1½ times the size.

Designs must be drawn with pen and perfectly black ink on white Bristol board, and must be sent in securely packed to prevent damage, with name and address of author written on the back.

To the author of the design which we consider the most suitable and the most artistic we shall award a prize of Ten Dollars, to that placed second Five Dollars, and to that placed third one years subscription to the CANADIAN ARCHITECT AND BUILDER.

The prize designs will become the property of the CANADIAN ARCHITECT AND BUILDER, with the right of making any arrangement with the advertiser with reference to publication of same.

The publishers reserve the right of purchasing any designs sent in competition other than the prize ones at a price not exceeding $2 each.

The James Smart Manufacturing Co., of Brockville, Ont., have authorized us to announce that they will also give a prize of $10 for the best advertisement that may be submitted for the Kelsey Warm Air Generator. They will be prepared to send to any contestant such of their printed matter as may be desired. Contestants for this prize should make their drawings with pen and black ink on white card board.

All designs must be sent in on or before December 5th, 1906. Any arriving afterwards will be ineligible for the competition.

All drawings must be addressed "Advertisement Design Competition," CANADIAN ARCHITECT AND BUILDER, Confederation Life Building, Toronto, Canada.

ARCHITECTURAL TRAINING IN MONTREAL.

The Architctural Department at McGill University opens its winter course with an increase in the number of students over all previous years. There are seventeen students on the roll and nearly all of these have the intention of following out the complete course of four years training.

The evening classes at the Monument National, under the charge of the Council of Arts and Manufactures, opened on the 15th of October. Instruction is given in Architecture by G. A. Monette and Alph. Venne; in Carpentry and Stair Building by Eug. Bertrand and Geo. Corriveau; there are also classes in freehand and mechanical drawing.

The Sketching Club of the P. Q. A. A. is to re-open its winter weekly meeting in the Association rooms on Wednesday, the 24th Oct. when the work of the season will be discussed, and first series of competitions will be announced.

"Standard" Fixtures

the Proprietors' Choice

Owners of Apartment Houses, Hotels and Office Buildings prefer "Standard" Fixtures above all others for their buildings as well as their homes. They know the superiority of "Standard" Equipment in appearance, durability and sanitation, for our extensive national advertising has taught them to discriminate in our favor.

Plate P-878—"Standard" Porcelain Enameled "Delecto" Syphon Jet Closet with 1¼ inch Brass Connection, Plain Oval Seat and Paneled Cover, Nickel-plated Cast Brass Hinges Nickel-plated Brass Vimometer, Floor Flange, Rubber Gasket, Screws, Bolts and Washers complete.

Standard Sanitary Mfg. Co. Pittsburgh, Pa., U. S. A.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

Room B, 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2299.

720-721 UNION BANK BUILDING, WINNIPEG.

DAVIS CHAMBERS, HASTINGS STREET, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	JOHN E. BELCHER, Peterborough
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

J. WILSON GRAY	Toronto
S. G. CURRY,	"
J. W. [illegible]	Ottawa
A. [illegible]	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	A. CHAUSSE, Montreal.
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	D. R. BROWN, Montreal.
SECRETARY	J. E. VANIER "
TREASURER	J. R. GARDINER, "

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal.
JOS. VENNE	Montreal,
F. C. OSPELLET	Quebec.
P. E. NOBBS	Montreal.
C. S. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—A. R. DECARY AND C. DUFORT.

ALBERTA ARCHITECTS' ASSOCIATION.

PRESIDENT	P. DEGENDORFER, Edmonton.
1ST VICE-PRESIDENT	J. LLEWELLYN WILSON, Calgary.
2ND " "	J. A. MACDONALD, Lethbridge.

COUNCIL.

H. D. JOHNSON	Edmonton.
E. C. HOPKINS	Edmonton
GILBERT HODGSON	Calgary,
W. S. WILLIAMS	Medicine Hat.
JAMES E WISE	Edmonton.
R. G. GORDON	Calgary.

REGINA ARCHITECTURAL CLUB.

PRESIDENT	W. W. HILTON.
VICE-PRESIDENT	F. CHAPMAN CLEMESHA.
SECRETARY-TREASURER	W. B. VANEDMOND.

COMMITTEE

J. H. Puntin. A. C. Barrett. Ernest E. Carver.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE DUTHIE, President.	H. MARTIN.
THOS W. SELF, 1st Vice-President.	THOS. CHRISTIE.
C. W. BATT, 2nd Vice-President.	J. K. HOIDGE.
JAS. CRANG. Treasurer.	JOHN ALDRIDGE.
	JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY,
Auditors—O. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE.

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.	J. JONES.
JNO. WHITAKER, 1st Vice-President.	CHAS. ODELL.
GEO. HYATT, 2nd Vice-President.	T. WRIGHT.
GEO. S. GOULD, Secretary-Treasurer. 473 English St.	H. STRATFOLD.
	A. NOBBS.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOM, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M FRASE
H.A. BALL, Treasurer.	E. G. BAINS
T BRADERY	D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

A.T. DAVIDSON, President.	A. E. PORTER, Secretary.
J. W. MORLEY, 1st Vice-President.	T. D. ROBINSON, Treasurer.
T. R. DEACON, 2nd Vice-President.	

Directors: Thos Black, Jos. Bourgeault, E. Cass, D. Cameron, V. L. Bouch, Wm. Alsip, Ald. J. G. Latimer, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. P. Alsip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.	JOHN DUTHIE.
JOS. O. DESLAURIERS, Vice-President.	JOHN L. HARRINGTON
J. HERBERT LAUER, Secretary.	JOHN GRAY.
N. T. GAGNON, Past President.	ALEX. BREMNER.
W. E. RAMSAY. J. LEFEBVRE.	J. N. ARCAND.
W. B. SHAW.	JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
E. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange)
85 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President.	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHARPENTIER, Jr., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUS S. Treasurer.	E z COTE.
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

The Don Valley Brick Works

are now manufacturing

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

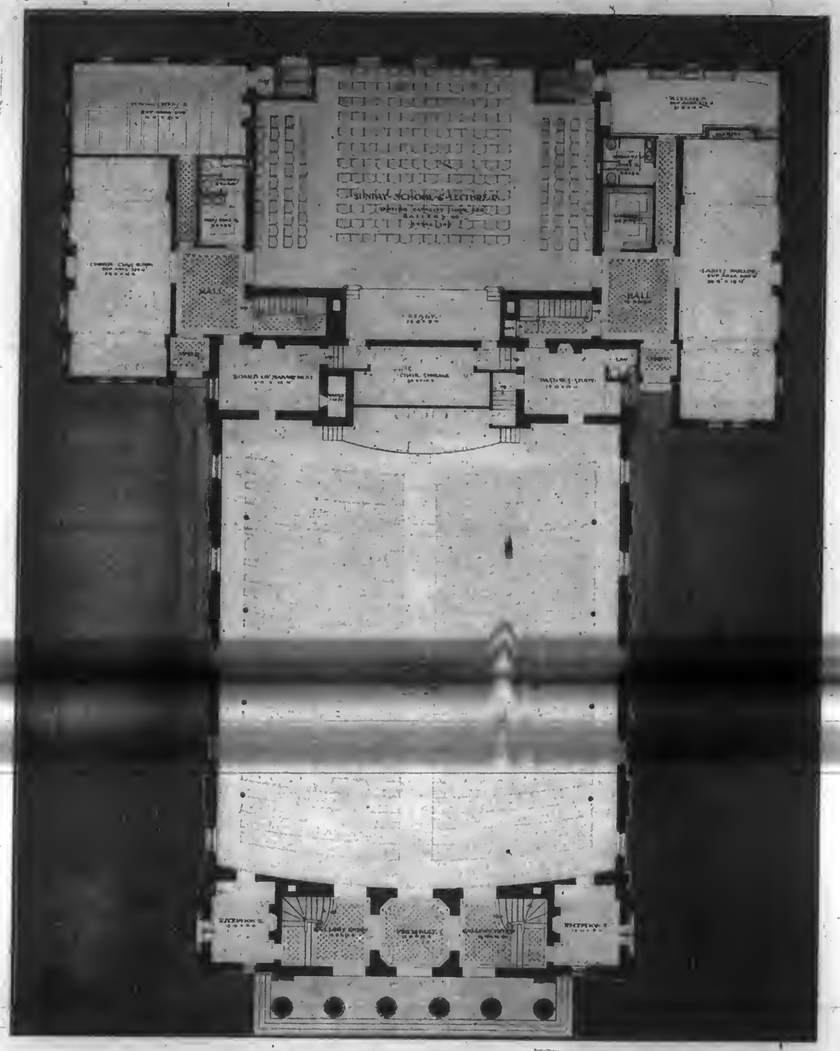
Kindly Write for Prices

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1888

EMMANUEL CHURCH, MONTREAL.

Side Elevation.

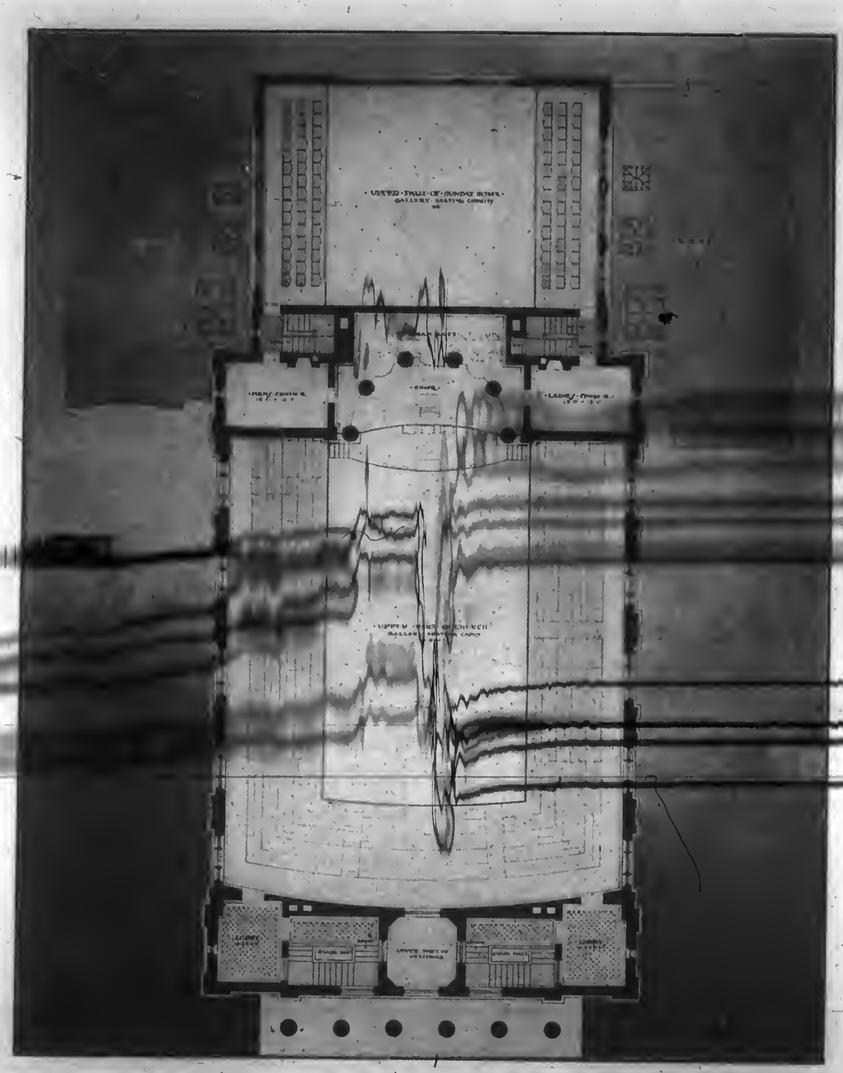
MESSRS. MAXX AND ARCHIBALD, ARCHITECTS, MONTREAL.



EMMANUEL CHURCH, MONTREAL.
FLOOR PLAN.

MESSRS. SAXE AND ARCHIBALD, ARCHITECTS, MONTREAL.

CANADIAN ARCHITECT AND BUILDER.



EMMANUEL CHURCH, MONTREAL.
GALLERY PLAN.

MESSRS. SAXE AND ARCHIBALD, ARCHITECTS, MONTREAL.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1906.

EMMANUEL CHURCH, MONTREAL.
FRONT ELEVATION.
MESSRS. SAXE AND ARCHIBALD, ARCHITECTS, MONTREAL.

The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - - PUBLISHERS.
W. A. LANGTON - - - - - - - - EDITOR.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No 227. NOVEMBER, 1906.

ILLUSTRATIONS ON SHEETS.

Docklands, Ingatestone, Essex.
Houses of Small Cost in a Country Town. No VI. Design by "1500."
The Aged Women's Home, Toronto; Messrs. Langley and Langley, Architects, Toronto.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Casa de las Conchas; Facade and Patio.

CONTENTS

Editorial	161-162	Montreal Notes	170
The Uglification of Ottawa and Quebec	163	Sketching Club, P. Q. A. A.	170
Personal	164	Some Recent Building Permits in Montreal	171
R. I. B. A. Local Examinations	164	Spontaneous Ignition of Woodwork	171
Canadian Architect and Builder Competitions	164	The Disappearance of Lumber	172
Flat Fireproof Roof	164	Manitoba Association of Architects	173
Our Illustrations	165	The Use of Spruce, Balsam and Popular	173-174-175
Ontario Association of Architects	165	Colouring Brickwork	iv
Why Some Houses are Cold	166	Wind Anchors for the Singer Building	ix
Illumination of the Royal Alexandra Hotel, Winnipeg	167-168	Building on a Percentage Basis	x
Resurfacing Hardwood Floors Economically	169	The Ownership of Architects' Drawings	xi

Bricklayers and Concrete Construction.

An agreement has been made between the master masons of New York and the bricklayers' union that all the work of placing concrete is to be done by bricklayers. This does away, as long as that agreement is in force, with the advantage of cheap labour which is in favour of concrete. But it does not do away with the fact that concrete can be done by cheap labour. An artificial condition is created which it will be difficult to maintain. At the very outset—if a bricklayer is to take the place of every labourer required for the fulfilment of current contracts for concrete work—more bricklayers will be required than the union can supply. Will the union admit unskilled workmen to membership for the purpose of supplying bricklayers enough for this work, or will they hold up the contracts and injure the carpenters and other trades—to say nothing of the contractors, and possibly the law? It is evident that if this agreement is adhered to some of the forces that are making the history of trades unionism will be set in motion. A slight acquaintance with history suffices to remind us how the unrighteous exercise of power on the part of kings has always led to its curtailment, and there is nothing different to be expected in the case sectional tyranny of any other kind.

The Abolition of Closets.

Under the title "A Much Needed Reform," the *American Carpenter and Builder*, which probably represents popular opinion in the largest class of house builders, has inserted a contributed article which advocates the abolition of closets in the partitions of bedrooms.

The ground of objection is sanitary. Partition closets are apt to reach so far, that they get little light and imperfect ventilation. Professor Kerr has expressed all this long ago as the best English opinion.

The partition closet has two advantages:—the quantity of space that one sometimes gets in them; and the saving in furniture. One would feel inclined to stand up for them, (with the condition that they should be planned so as to have a window for light and air), but for one objection—they spoil construction and lead to degenerate planning.

The proper construction for wooden interiors is undoubtedly that every upper partition should stand on the head of a partition below. If the upper partitions stand on the joists, the whole fabric is at the mercy of shrinkage; and, when bedroom partitions are double, (to provide closets between them), this condition is a necessity. Then follows the attitude of the average Canadian householder in a new house; patiently waiting for "the cracks" to develop in the plaster, before he papers.

As to resulting degeneracy in planning:—when upper partitions are placed without reference to those below, there is a great loss of "backbone" in the plan; and a tendency to pettiness in style is the result.

Noise in its Sanitary Aspect.

A paper read at a meeting of the Sanitary Inspectors' Association in Blackpool, England, by Dr. Theo. B. Hyslop, states the evidence in proof of what we have all begun to suspect, that exposure to noise—mere noise—is exhausting. Much more is this the case when the noise occurs with sudden shocks, or is disagreeable to the ear; and, above all, when there is no cessation of it at night. The evidence of injury in the latter case is interesting and indicates how it is that constant noise results in derangement of the nerves, and, in too many cases, in derangement of the mind.

Observations made in the case of animals, and of men whose brains have been exposed by injury or operation, prove that the vessels of the brain contract during sleep and the brain grows pale, expanding again and taking on a rosy hue at the moment of awakening. The application of "graphic methods"

has shown that every sudden noise causes an increase of blood in the brain without awakening the sleeper. In other words every sudden noise presses action upon the brain; and we know from experience that it is not only the suddenness of noise but also its continuance that wearies us. Everybody knows the feeling of relief that comes over us when ventilating machinery stops, though we did not before notice its action or the strain it imposed on us. The peace of a snowy day in the city—when all sounds are muffled, and even the roaring of the trolley cars is subdued—is also a thing that haunts the memory. The enjoyment of these moments of peace is a measure of the strain that is upon us when, however uncousciously, we are bucking against the noise. It is this strain that is wearing us out; sending some to travel and others to be shut up in asylums; but for most of us, who are not liable to break down—or are not liable to break down *yet*—just keeping our brains uselessly active all the time; adding to the effort of life and subtracting from the strength available to meet it.

The question of course is how much of this we must bear and how much we need not. Mitigation of the main trouble means large dealings with the street traffic which is the main source of noise. What has been done already in this way is an indication of what can be done. A generation is growing up, in this country, which has never known what the noise of a cart on cobblestones is like. The change that has resulted in London, by the general adoption of rubber tires, is to be measured by the astonishment with which, when watching the smooth going of the carriages along the drive in Hyde Park, one hears approaching from the distance the rumbling of a steel-tired carriage that some old fashioned person has brought up to London from the country. The London of Pendennis must have had a very noisy splendour. They have a new noise problem now in London in the shape of the motor busses. If one may judge from the outcry about them, there will be some effort to get rid of their noise, made in time to be of service to us when this form of transport reaches us. In the meantime our large problem is the trolley car, before which motor omnibusses are silent and ashamed. If it survives as a means of transport, it will probably go underground to leave more room on the streets, and so we shall get rid of its noise when we are not using it. But this is merely speculation about the future; what can be done now is of more importance, if in a smaller way.

If we reflect upon the numerous noises that combine to heap annoyance on us, it is surprising how many of them are of a private character, which no man can have a right to inflict upon his fellow citizens and which therefore may be restrained. They are part of our general carelessness about living, and it is to be feared, if examined into closely, would be found to be the indirect result of a lax or undeveloped public morality. We let others do to us what in the same case we would be likely to do to them.

A manufacturer who wants to intimate to half a hundred employees—all waiting within sound of a hand bell—that it is time to go to work, blows a whistle that makes a noise a mile away. Piano organs, with the terrible mandolin touch, can bray the most painful music over and over for half an hour in one small area. The seductions of cheap amusement are now-a-days indicated by a phonograph, turned out of doors and delivering raucous noises into the street. Negro minstrels—foreign negro minstrels—are free to march down our streets and bang rag-time into the ears of horses that are accustomed to classical music. In building operations the signals intended for the ear of the hoisting engineer are delivered to a whole neighborhood. Anybody who wants to advertise anything can ring a bell, blow a horn, or shout. Anybody can shout, so long as he does it every day.

How differently they manage these things in Germany. Only the other day we had in the telegraphic news from Berlin an account of two men who were arrested for loud sneezing. Sneezing! There is a fortune awaiting the man who can sneeze loud enough to be heard across one of our streets. He need do nothing henceforth but take snuff and charge admission. It was doubtless to amuse us that this piece of news was given to us by cable; and it did amuse us. But, when one comes to think about it, should we not be the better for a little paternal legislation in the matter of noise.

The representative in New York of an eminent firm of German booksellers used to visit the offices of architects in this country. On one occasion he came after having visited Germany for the first time in twenty years. He had found himself an American in habits of mind, and Germany was strange to him. In particular these paternal restrictions to free action gave him annoyance. He threw a piece of paper in the street; a policeman made him pick it up again and pocket it. He tried to smoke on the tail end of a street car; the conductor tapped him on the shoulder and told him he must not. He had to behave himself in ways that were strange to him, and disagreeable. He wanted to go back to New York and be happy. "But presently," he said, "I reflected that all these things they would not let me do were things I ought not to do. I began to look at things in another way, and came to the conclusion that paternal government was a good thing, and that I liked living under it better than living in New York." This is the testimony of a New Yorker to the enforcement by law of such consideration for the feelings of the community as would be observed by considerate people. If some enactments of the kind were made in Canada, so as to prohibit preventible noises, there would be something done to relieve the waste of energy involved in living in cities.

To Subscribers.

We appreciate very much the many kinds expressions regarding the CANADIAN ARCHITECT AND BUILDER received from time to time from its subcribers. It would be of great assistance to us if those subscribers who have found the paper valuable and interesting would kindly recommend it to their neighbors and friends. We would like to add to our present list of 3,500 subscribers at least 500 new names during 1907. We solicit the kind co-operation of our subcribers and friends for this object. Will every present subscriber make an effort to help us to the extent of sending us the name of at least one new subscriber during the coming year, or the name and address of some person who might be induced to become a subscriber.

THE UGLIFICATION OF OTTAWA AND QUEBEC.

We hear a great deal of talk about the beautification of Ottawa, but to an old inhabitant of Ottawa, visiting it again recently, after some years of absence, the first impression is that the general beauty of Ottawa is less than it was. It has received irrecoverable injury from the entrance of the C. P. R. into the middle of the city from across the river. Formerly the view from the bridges over the canal was agreeable on the side of the "deep cut;" and, on the side towards the river, there was a view which would be a possession for any city; looking down the wide descending ravine with eight locks connecting the canal with the river; a high bluff on each side; the Parliament Buildings on one, the trees of Major's Hill on the other; the wide river at the bottom, and, beyond, the range of hills on the Gatineau. Here was a noble composition which though viewed from the very centre of a city had no note of the ugly necessities of city life. A saw mill on the opposite side of the river had pictorial value as a distant object. The descending locks were picturesque in themselves and interesting as a spectacle when in operation. The ravine, with the locks running down the bottom as a central object, was a natural composition. But all that is changed. On one side the ravine is ledged to let the C. P. R. come in from across the river. The ravine, the fore ground of the view, is thus ruined for ever, and a large cantilever railroad bridge dominates the whole scene, crossing the river in the middle of the view. We have been trying hard for a generation to acquire a taste for iron as an architectural material; but it is of no use. Iron it not an architectural material. Whatever it may turn out to be as a material for use in concealed construction, as a visible object there is no doubt about its objectionableness. Iron is ugly, and an iron bridge is an ugly object. Its only merit is size, which puts it out of scale with the rest of the landscape. All this change—drawing ugliness across the scene on one side of the bridges, and making a shunting yard of the old canal basin on the other—is in order that a railway that has already entered the city not far from the centre, may have a new entry and another station. Wherever the convenience of the present station, it is not enough to make up for the disadvantage of its position. There is always a precisely right way of doing everything. It requires only two conditions—thought, which people are sometimes willing to give, and money which they cannot always find But in a case concerning the beauty of Ottawa, somebody ought to have supplied the thought; and, if a station in another spot—a Union Station avoiding all the inconvenience of the present double arrangement, cost more money—which is doubtful—there would be no great hardship in requiring the C. P. R. to spend it.

Both thought and money are being spent now in beautifying Ottawa by details. The details may be beautiful when one gets to them, but the one point where everybody gets to every day was beautiful enough if it had been merely preserved from ugliness, and that was been allowed to invade it.

Another railway is threatening Quebec. The C. P. R. got in its work there too, in getting for its hotel a site that impinges upon Durham Terrace, if it does not actually invade its area. By great good fortune the hotel building is not amiss. Its scale is a little overpowering for the Cape, but scale is increasing all over the town and whatever the total effect may be, the size of the hotel is likely to be balanced. It may also be said with truth that the great view from Durham Terrace gives pleasure to more eyes and does more good to Quebec when the Terrace site is occupied by an hotel than if it were occupied by a public building. But this is a happy accident. These benevolent purposes are not likely to have directly actuated the C. P. R. in getting possession of the site nor of the party—the party in power—who gave it to them. The public needs to beware of the railways. Their service is necessary but it is not necessary that they should be our masters. They are concerned only with making money. The amenities are nothing to them; and, when they are taking steps to destroy beauty in order to save themselves money, they do not first lay the matter before the public who value beauty. They lay the matter before some one who will get it "through" for them with the least disturbance, and, before the public know anything about it, the thing is settled beyond recall.

It is probably news to most of our readers that the Champlain Market at Quebec, the foreground of the view from Durham Terrace, (or Dufferin Terrace as is seems to be all called now,) is doomed, in order to serve the purposes of the Grand Trunk Pacific. That railway will have its station right under the terrace; and instead of the Champlain Market—a respectable building, in the right scale, sufficiently imposing without attracting too much attention to itself—we are to have a passenger station which is sure to be big and must be either truthfully ugly or falsely and painfully fine; and, seen from above as it will be, will probably show up as both ugly and false. But the building is only an item in the change. The exchange from the human interest of the market to the ugliness and noise of a train yard is painful to think of. Who will want to hang over the railways of the terrace when this substitution is made? It will be no more all delightful. The distant view will remain, but one will shrink back from the edge to look at it and try to forget the existence of the railway.

Is this necessary for the prosperity of Quebec? Not a bit. The prosperity of Quebec is bound to come with the increase of the tonnage of steamers, which makes it difficult for them to go up to Montreal. When commerce was carried on by sailing vessels, which could not get further than Quebec without the aid of steam tugs, Quebec was an active port. With the increase of steam and the decrease of sailing vessels its importance declined, until now, as a port, it is almost dead. But its turn is coming again. Already the large C. P. R. steamers have to make Quebec their terminus. The Grand Trunk Pacific is building the biggest steel bridge in the world in order to get there in time for the trade; and it would get there all the same if it had been forced to go round behind the town and enter at St. Roch's. There are docks there and room for more, so that it could do some of its freighting business there as well as the delivery of passengers—which is all this article is intended to advocate. For passengers, the hills on this side of the town are far the more convenient for coming and going to a station. Mountain Hill is too steep for a loaded cab. It would be really less strain upon a horse, drawing a load from Champlain Market, to go round to Palace Hill, Ocean

passengers it is true may be a little nearer their docks, if they detrain at Champlain market, but they will not be in contact. It is not proposed to entirely oust the cabman; and, so long as there must be vehicular connection, a little more or less would not matter. There are no great distances in Quebec; nothing to compare with the distances in New York, which have not at all injured the reputation of New York with ocean travellers. For whose advantage then is this entry of the Grand Trunk Pacific into the lower town along the water front? So far as one can see the advantage is only for the railway. The descent from the bridge is easier, it is said, along the river than across the promontory and down on the other side. Cheaper it may be to construct, but it is hard to see how it can be easier, as a grade, when the ultimate level is the same and the distance to St. Roch's is greater. The obvious reasons is that the great objective of the railway is the coves where the shipping of freight will be done. The road along the old coves, underneath the cliffs descending from the plains of Abraham, has always been and, even now, in the ruined state of the coves, is a delightful piece of picturesqueness, kept so by the fact that the old traffic in square timber required no railroad. The freight, floated down the river, met the ships at the piers; and the road along the shore was merely a narrow street lined by the dwellings of the workers in the coves; with the usual church among them, built on the very edge of the river, so that one could fish over the railing of the churchyard. All this of course has got to go. Freight will now come down by rail. The new coves will be no doubt the small end of one of the funnels into which the northwest wheat is poured; and when Quebec is busy again there will be rails, trains and smoke in plenty along the coves. There could not be a better place to carry on large traffic in connection with a city without injuring the city's beauty. The riverside here is round the corner from the city, at its point of outlook from Dufferin Terrace; and the Plains of Abraham above are so well above as to receive no injury, or none that would weigh in the question. But this admirable plan, so well arranged by the accident of the Cape's projection, is to be upset by the proposal to extend the railway round the corner in order to bring in passengers where there is no real need to bring them in.

A proposal to prohibit this injury to Quebec is not reactionary, but the reverse. This will be the judgment of the future and a near future too. Such a proposal would not be tolerated for a moment in the United States in the case of a city like Quebec, with great natural beauty preserved so wonderfully up to the present time. They are a generation in advance of us in these matters; and we limp behind, copying their discarded vices; like regular second-raters, incapable of seeing the merits of those they aspire to imitate, and copying only their defects.

PERSONAL.

Mr. F. S. Baker F.R.I.B.A., has removed his offices to the new Traders Bank Building, Toronto.

Mr. G. A. Hodgson, of Ottawa has patented and is placing on the market a safely revolving window.

The steel square, as a calculating machine is a recent publication from the pen of Albert Farr. It contains simple directions for using the common steel square for difficult calculations that are met by carpenters, builders, lumber dealers, plumbers, etc. Some of the practical questons dealt with in this little book are the choice of a square; lines, surfaces and solids; right angles and right angled triangles; polygones.

R. I. B. A. LOCAL EXAMINATIONS.

The Canadian examinations were held in Toronto on November 16th, under the direction of Mr. F. S. Baker, F.R.I.B.A., Honorary Secretary for Canada of the Institute. Three candidates entered for the examination but only two, Mr. A. E. Anderson and Mr. K. G. Rea, were able to attend. Both came from Montreal. The papers are returned to England for examination; but the local examiners hold an oral examination, and report the result, as contributory evidence of the candidates qualification. The local examiners this year were Messrs C. H. C. Wright, Professor of Architecture in the School of Practical Science, Toronto; Percy E. Nobbs, Professor of Architecture in McGill University, Montreal; and W. A. Langton, Architect, Toronto.

THE CANADIAN ARCHITECT & BUILDER COMPETITIONS.

A correspondent writes:—

I am a student. I intend to try the third competition; but I think that it is given on a field too large, and that there are not sufficient explanations given, as to the size of grounds, as to the height of the shop, and as to the approximate cost of the whole house.

The reply to this letter was as follows:—

The intention of these competitions is a variety of designs and, for that purpose, the conditions are not laid down too closely.

You have chosen the problem which is most fixed in its conditions. If I add that a shop of this description would usually have two storeys above the shop I should fix the whole front. (The depth from front to rear is supposed to be, as such lots always are, sufficient for a shop with a dwelling over it). I can however conceive, that a shop front with one storey and a roof storey over, or two storeys and a roof storey, would be desirable designs; and I do not wish to limit the possibilities to two storeys only.

There will, I think, be no difficulty in comparing the excellence of two designs of different size.

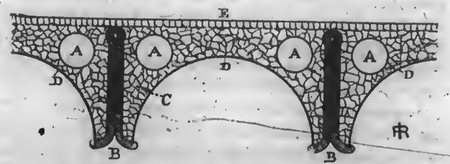
FLAT FIREPROOF ROOF.

A correspondent of the *Building News* sent to that journal the following suggestive letter:—

Why we in England are so fond of the ugly timber and slate roofs which everywhere obtrude, I cannot explain, but to those who have lived in South [illegible] where the roofs are nearly always flat, it is apparent that there are many advantages over our usual form.

I send you a sketch of a plan for a fireproof roof of the better sort. B B are steel girders connected by semi-cylinders, D D, of enamelled iron, so that with proper attention to colour the ceiling below is already made washable and almost indestructible. A A are tubes of thin iron which are put in to save weight. C is the concrete filling, which may advantageously be made of a mixture of broken limestone or marble, pumicestone in small fragments, and Roman cement, with, of course, the proper quantity of water. E, the surface of the roof, should be of the tessellated and cemented mosaic work which one now so often sees laid down in front of shops. Some of these I have had under notice for years, and although they are fully exposed to sunshine and to frosts, they do not show any weather cracks, so I presume they would behave similarly on a roof. The tubes A A are, of course, propped in place by temporary supports when the concrete is poured in.

The girders, I think, might be as much as 2 ft. 6 in. apart, and the marble and pumice ought to be had cheaply. The principle



is somewhat that of a human bone where one has a light cellular middle encased in a harder covering or shell.

OUR ILLUSTRATIONS.

DOCKLANDS, INGATESTONE, ESSEX.

Most villages in the agricultural districts of England have a house or two of the larger size closely connected with them. Often the entrance is from the main street; but the house is likely to be retired in grounds which according to our standard would be called large. Of this class is the home before us which is worth examining as an example of the great simplicity that is usually found in the design of such a house.

The south side of the house looks upon the lawn and flower borders; the north side looks towards the village

street from which the house is approached by a drive of some length overshadowed by trees. The principal rooms give upon the lawn side, and on the ground floor open directly upon the gravel walk. The service department is in a wing a little retired (towards the front), and looking upon the kitchen garden.

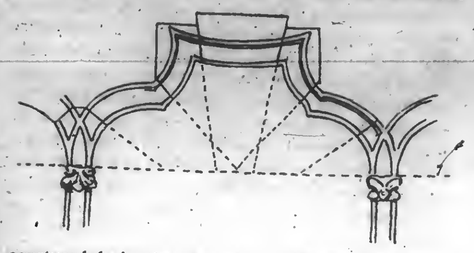
An interesting feature in most English houses of this type is a broad gravel walk, somewhere in the garden, protected on the north by a brick wall, so as to make a warm place in winter, where elderly or contemplative people, can "secure a walk" in the fine part of the day. There is much green in an English garden in winter, and, in such a garden as this, even in the northern counties, there would be more than a dozen kinds of flowers blooming in February.

THE AGED WOMEN'S HOME, TORONTO. MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.

This institution is now twenty-three years old, and has grown in that time from the use of a few rooms, set apart in another institution for the accommodation of aged women, to the point that a new building, containing accommodation for a hundred, is found to be necessary. The purpose of the institution is to provide comfortable and suitable accommodation, with a room that they can call their own, for aged women whose relatives, though willing to support them, are not able to accommodate them comfortably. The promoters of this excellent work have been properly praised in the newspapers, in the reports of the ceremony of laying the foundation stone on the 12th of this month. It remains for this journal to mention the name of the architect, and to direct attention to the satisfactory character of his work. The design was selected from several sent in in competition. The theme—an aggregation of similar small parts—naturally tends to simplicity. The one emphatic point, the entrance, will get more emphasis in perspective than in the elevation before us.

CASA DE LAS CONCHAS, SALAMANCA.

The shells (*conchas*) which enrich the facade of this building are the heraldic badge of the owner. The *reja*, or wrought iron screen, protecting the lower window is interesting. The fantastic character of the



courtyard design has the merit of harmony—harmony with variety.

The jointing of the lower arches, shown in the cut, is reproduced from a sketch.

HOUSES OF SMALL COST IN A COUNTRY TOWN. NO. VI. DESIGN SUBMITTED BY 1,500.

This drawing, the last of those selected from the CANADIAN ARCHITECT AND BUILDER competition of last February, has been kept back hitherto because in the zeal for secrecy as to the names of the competitors the name of this competitor has been lost, and efforts to discover it have been [illegible]. Perhaps the publication of the drawing may make it known to us.

The design was selected for publication chiefly on account of the combination of style and economy in the exterior design. In other words it is a good cottage design.

The plan could be made comfortable if the partition between the living room and hall was run right across the house, with a door opposite to the stair, and the fireplace turned to open in the living room. As the west end is in close connection with the kitchen it will be, (as shown), the dining end of the living room, where the fireplace will be less convenient than at the other end. This incompatibility between the best position of the fireplace and its distance from the kitchen is apparently to be bridged only by the erection of two chimneys, if the plan is to remain otherwise as drawn. There ought to be a furnace flue included in the kitchen chimney so that this chimney would remain as it is shown in the upper floor. A single flue for the fireplace would not occupy much room in the closets of the bedrooms in front. As to the cost—one can only say that it would be worth while.

THE ONTARIO ASSOCIATION OF ARCHITECTS.

The Annual Convention of this Association will be held on January 15th next at Ottawa. In addition to papers that are being arranged for, it is proposed to make visits to the park improvements, the buildings on Parliament Hill and the site of the proposed buildings on Major's Hill. This is the first time the Association has met outside of Toronto, where the greater number of architects live. There have often been proposals made by members living in other towns that the place for holding the annual meeting should vary. The first proposals came from an Ottawa member. It is an excellent idea, if well carried out, but will involve some activity upon the part of members residing in the place of meeting, so that the convention may be well attended and the discussions warm. It is expected that the papers will maintain the standard of interest of recent meetings.

WHY SOME HOUSES ARE COLD.

There are many buildings, especially dwelling houses, in which great difficulty is experienced during cold weather in raising the temperature to the point considered necessary for comfort and maintaining it there. In some instances there may be an easily discoverable reason for this. In others all attempts to discover the cause prove futile. Then the investigator can do nothing but fall back upon general principles and assume that the difficulty proceeds from some cause which has been found to exist in other cases. Sometimes the situation is blamed; it is to exposed. Sometimes it is the architect; the house is too straggling, or there are too many projecting wings and the re-entering angles catch the cold winds. Sometimes the builder is thought to be in fault; the house is badly built; the joints of the brickwork have not been properly filled and the wind whistles through them; windows and door frames have not been so set as to exclude draughts; unseasoned wood has been used, causing shrinkage and consequent draughts. Or—and this is most likely the first thing to be thought of—the heating apparatus is denounced and declared to be "no good."

Undoubtable any one of these thing may be the cause of the difficulty, or several of them may be contributing to it. But there is another point which is seldom thought of, and the investigation of which will often lead to the true solution of the problem. Although not perhaps so obvious as some of the others it is not at all mysterious. Unfortunately indeed it is [illegible] than remedied. The first thing to be done when attention is being directed to this point is to take two similar thermometers and and hang them in the same room and at the same level, one on an outside and the other on an inside wall. Some judgment must be exercised in determining the positions of the thermometers so that one of them may not be exposed more than the other to any disturbing factor. If thermometers of the ordinary type mounted on a wooden block are used, they must be allowed to hang long enough for the true temperature of the wall to communicate itself through the wood block to the bulb, for wood is a slow conductor. When a sufficient time for this to take place has elapsed, it will almost invariably be found that a higher temperature is indicated on the thermometer hung on the inside wall than on that on the outside one. Why? Because the temperature of the rooms on each side of the inside wall is probably about the same while there may be a difference of many degrees between the temperature of the room and that of the outside air. It is not surprising therefore that the temperature of the outside wall should be lower than that of the inside one. Indeed some difference is almost inevitable, even in a thoroughly well built wall, owing to perflation of air through its substance. But if the difference between the reading of the two thermometers is considerable, some other explanation must be sought for. And if the wall is a furred and lathed one it will probably be easily found. The object of the furring is to interpose an air space between the outside wall and the plaster, in order to prevent dampness from showing on the plaster. Theoretically this air space ought to add to the warmth of the room by interposing a layer of dead air between the lower temperature of the air outside the wall and the higher temperature of that in the room, because dead air is an excellent non-conductor. But the air in this space never is dead. On the contrary it is usually in active circulation. Further, it is cold air because it is fed from every crack through which a draught steals in.

A great deal is thus accounted for, but—and herein lies the crux of the whole matter—the chief source of the supply of cold air is usually the space between the upper ceiling and the roof. These spaces are proverbially hot in summer and cold in winter, unless indeed the roof covering happens to be of thatch. As roofs are usually constructed there is but little thickness of material to serve as a barrier between this inside space and the outside air. Further there are always numerous cracks and crannies through which cold air is freely admitted, especially about the eaves. Any one can easily verify this statement by going up into such a roof space where there is no window or skylight, and noticing the daylight streaming through these unauthorized openings. Even with a flat roof the same defect is usually present, only it is not so readily discovered. This cold air falls by gravitation down the spaces between the wall and the lath and plaster. If any further proof of the truth of this theory than that afforded by the thermometers is required, it can easily be obtained by boring a gimlet hole through the lath and plaster and holding the hand opposite the hole, when the stream of cold air will at once afford the necessary demonstration. This air will often be found to be of little higher temperature than the outside air.

The practical result of this is that many a house which has been honestly intended by all concerned in building it to be well and substantially built in every way, turns out to be anything but a comforable dwelling place. No [illegible] may have been spared in making the walls of ample thickness "for the sake of warmth," as the unsuspecting owner remarks, fondly imagining that he is going to have a substantial barrier between him and the cold that will keep him snug and warm when the frost is keen or the wind howls and the snow is drifting and that, incidentally, will also help to keep down the amount of his coal bill. He does not know that, instead of having a thick wall between him and the cold outside air he has only in reality a bit of thin lath and plaster It is hardly surprising that he should wax wroth and say things when he makes the unpleasant discovery. His annoyance is not lessened by the consideration that it is by no means an easy matter to remedy a defect that might have been quite easily obviated. Some simple precautions are all that are necessary. For instance the walls should be carefully built with every joint filled full of mortar. The roof should be constructed so that there will be no crevices to admit cold air, and non conducting materials should be freely used. Then if the walls are to be furred the spaces thus formed should be carefully stopped at top and bottom so as to form dead air chambers. This may be done by a projecting course of bricks on which the furring strips would butt at each story. This indeed should always be used as a precaution against spread of fire. But it is better to do away with the furring altogether and build the walls hollow. In any but the very thinnest walls this would cause no increase of cost as the saving of the cost of furring and laths would easily pay for metal wall ties.

Even after a house has been completed the trouble, if it cannot be entirely cured, may at least be mitigated by the stopping of roof crevices, and by stuffing the tops of the spaces between the lathing and the wall with mineral wool or some similar substance. It is not however always possible to get at the wall head to do this. Then the only alternative is to cut out a strip of plaster below the ceiling along the whole length of the outside walls and then to do the stopping in any way that may be found expedient in the particular case.

If architects would keep this subject in mind when preparing their plans and specifications, and make provision therein for the necessary precautions being taken, and if builders and their men would take pains to see that these precautions were efficiently carried out there would be fewer complaints of cold houses, and much discomfort and many disappointments would be averted.

D. B. DICK.

ILLUMINATION OF THE ROYAL ALEXANDRA HOTEL, WINNIPEG.

By EARNEST C. WHITE, M. L.*

In point of size and excellence of architectural design The Royal Alexandra Hotel at Winnipeg will doubtless

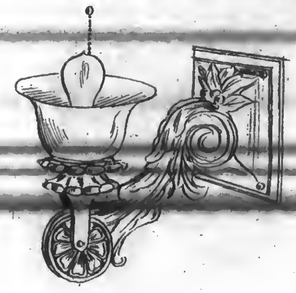


FIG. 1.

be preeminent in Western Canada for some time. The scope of this article however, does not permit

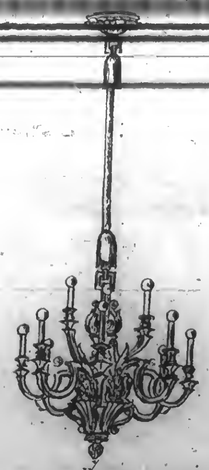


FIG. 2.

remark upon even the most notable features, except the lighting of some of the principal rooms.

The "L" shaped rotunda on the ground floor extends along nearly the whole of the south and west sides of the building, and is about 60 ft. wide, or a total of about 11,000 sq. ft. In this space columns are located, forming bays about 20 ft. square. At present the only lights are those supported on cast bronze brack-

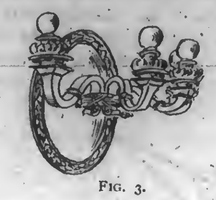


FIG. 3.

ets of the general design which is shown in Fig. 1; there being four of these brackets on every column. Each bracket is equipped with a 16 c. p. lamp in a 6" opalescent shade. There are about 130 of these brackets, all located so that the lights are about 7 ft. above the

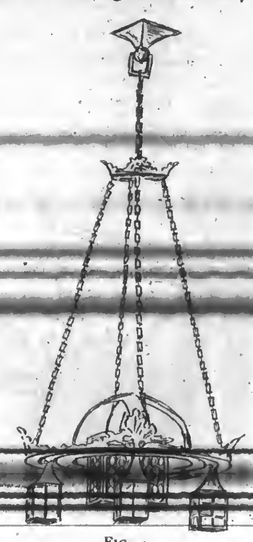


FIG. 4.

floor. Provision has been made for seven chandeliers or ceiling lights, which are not yet installed. These will greatly tend to improve the present illumination, which is somewhat trying on the eyes on account of all the lights being in the same horizontal plane and

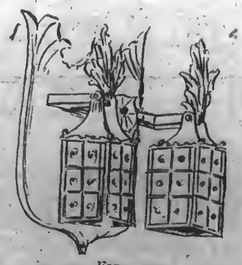


FIG. 5.

directly in the line of vision. It is interesting to note that a certain appreciable eye strain was experienced while the intrinsic brilliancy of the lights was greatly reduced by roughed inside globes, which were used

*Engineering of Illumination, 88 Princess Street, Winnipeg.

temporarily before the delivery of present shades. This objection should be obviated when the chandeliers are installed, as the bracket lights will be less trying in view of the greater average illumination, although doubtless the present clear bulbs will eventually be replaced by frosted bulbs of a shape more in keeping with the design of the shades. Only one serious criticism can be made of this lighting, viz: that the reading tables which are located near the windows along

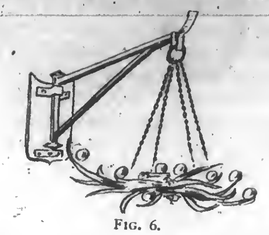


FIG. 6.

the sides of the rotunda receive no illumination worth mentioning. When the ceiling lights are installed the total capacity of the lights will be about 1.2 watts per sq. ft. of floor space. This is not a sufficient allowance for very effective illumination with a 20 ft. ceiling.

The main dining room is 108 x 50 ft. This is lighted by three chandeliers of the design shown in Fig. 2,

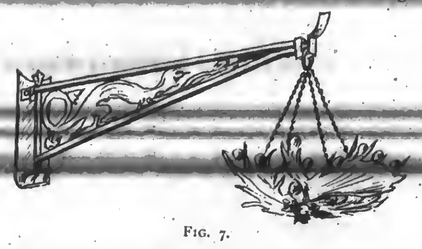


FIG. 7.

the central one having 24-6 c.p. frosted lamps, and each of the others 16 lamps of the same capacity. There are also twelve brackets as shown in Fig. 3 each having [illegible] very pleasing general work of mild illumination which is entirely sufficient when table candelabras are used. Floor receptacles are provided at frequent intervals,

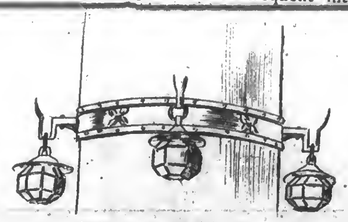


FIG. 8.

and a great many such candelabras are used, so that much can be said in praise of the general effect.

In the café, which is 68 x 45 ft. and opens into both the main dining room and the rotunda, a very different form of fixture is used. There are eight chandeliers and twelve brackets of the design shown in Figs. 4 and 5, these being of wrought iron with leaded glass lanters. The effect is good from a decorative standpoint, the only crudity being in the use of clear, instead of half frosted, lamps in the smaller lanterns which are open at the bottom. The use of prismatic shades over these lamps would also greatly increase the general illumination of the room without destroying the artistic effect, as the shades would be entirely concealed, but would prevent the present very high degree of absorption.

In the bar, wrought iron brackets, as illustrated in

FIG. 9.

Figs. 6 and 7, are used to support antlers wired for 8 to 10 lamps each. There are also sixteen bracket lanterns supported on four columns as illustrated in Fig. 8. The general lighting is quite sufficient for all purposes, although the use of 16 c.p. clear lamps on four of the antlers is not quite in harmony with the very artistic surroundings.

On the first floor an excellent example of modern

FIG. 10.

illumination may be found in the drawing room, which is 64 x 50 ft., the prevailing decoration being old gold with walnut furniture. There are five 7-light ceiling [illegible] The shades used are of yellow art glass with nine 16 c.p. lamps. It must again be suggested that the use of half frosted lamps with small reflectors fitting over

FIG. 11.

the lamp and concealed within the art glass shade would add refinement to the scheme, and at the same time increase the general illumination of the room. In addition to the ceiling fixtures there are eight 3-light brackets, of general design as shown in Fig. 10. The 8 c.p. lamps used on these brackets are completely

covered by leaded art glass shades. In keeping with the rest of the fixtures, are six walnut portables, illustrated in Fig. 11, with art glass shades, and equipped with three 8 c.p. lamps each.

Fig. 12 shows a wrought iron billiard table fixture, of which two are used in the billiard room. From the

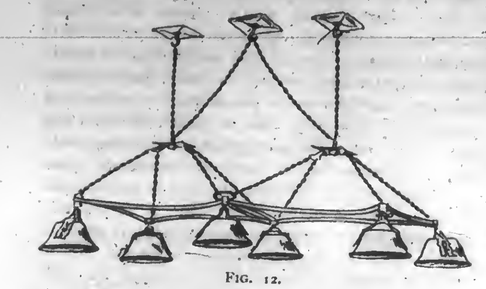


FIG. 12.

standpoint of illuminating engineering it is a disappointment to find two 16 c.p. lamps inside of each of the metal shades, which are painted white on the inside, and the lamps placed at a very ineffective angle. The resulting illumination is sufficient, but could have been much better accomplished by using only one 16

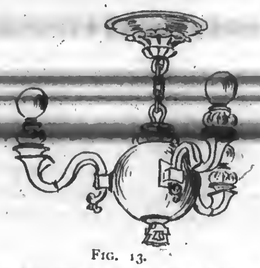


FIG. 13.

[illegible] most efficient form of prismatic reflector which would be completely concealed by the opaque metal shade.

Figs. 13 and 14 illustrate a ceiling light, and bracket used in first floor hall and billiard room. As a general thing it is difficult to produce either a pleas-

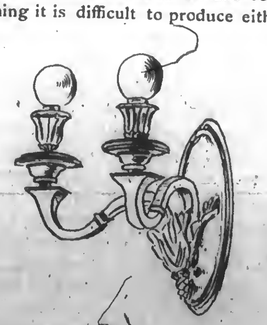


FIG. 14.

ing effect or good illumination by the use of ceiling fixtures having arms pointing up, so as to obscure the downward lighting. This also tends to produce very inartistic ceiling shadows.

It must be observed that the faults in illumination in this hotel are due in most cases to the pointing of lights upward instead of downward. This has an unfortunate effect in the lighting of bedrooms where all brackets have been located with a view to furnishing illumination near dressing tables, etc., but as the lights are pointed upward, and fitted with frosted shades, the illumination is far from sufficient. It would also have been better in a hotel of this class, to provide some general lighting from a ceiling fixture in the bedrooms.

RESURFACING HARDWOOD FLOORS ECONOMICALLY.

Every house owner knows the cost of keeping hardwood floors in repair. Notwithstanding the best care the floors in time will become marked, the surface darkened by wear, and instead of being bright, clean and attractive the floor becomes an offense to the eye. Usually it is considered necessary to have the floors cleaned and put in shape every year or so, and occasionally to go to the expense and bother of having them scraped by hand, a tedious and costly process.

Few people would have been willing to admit that a machine could be devised that would "scrape" a floor, get into every corner and close up to the baseboards, and do the job as neatly and with one tenth of the expense that such work is done by hand. The "Little Giant" floor scraper, it is claimed, will do

THE "LITTLE GIANT" FLOOR SCRAPER.

this apparently impossible work. Sufficient tests have been given to enable the patentee and manufacturing company, the Hurley Machine Company, Limited, of Toronto, to go before the trade with this assertion, which it stands ready to substantiate on any occasion.

The retail lumberman should be interested in this invention. Frequently people of moderate means hesitate about putting in hardwood floors because of the expense of keeping them in repair. Probably the average builder does not relish paying out each year or every other year in cleaning a floor as much as it cost to put it in. Genius has come to his assistance and made it possible for him to indulge this taste for hardwood floors, with the assurance that when necessary they can be cleaned and put in shape at a very moderate cost.

Retail dealers are concerned with this invention because they can, by keeping the scrapers on hand, increase their sales of hardwood flooring and rent or loan the machine to carpenters or decorators to scrape the floor when that process becomes necessary. The price of the scraper is $65.00 f.o.b. Toronto Canada, and this investment by a retail dealer in an ordinary community should be made good several times each year by the additional profits from selling hardwood flooring or whatever moderate rental he may charge those who use the machine which is sold by the Hurley Machine Company, Limited, 117 Home Life Building, Toronto. The accompanying illustration shows that it is possible to scrape up to the baseboards and that the machine does what is claimed—gives a new surface to the entire floor.

MONTREAL NOTES.

In more ways than one the season now closing has been one of the best. The weather has been exceptionally favorable to building operations and the building operations have been extensive. But everything comes inevitably to its end, and the best of businesses have their setbacks. Of the large number of buildings which have been pushed forward, in the view of being roofed in before the cold weather should arrive, a considerable proportion has failed to reach this hoped for point. The difficulty in most cases has been the structural steel work. The three firms in the city who handle this class of work have all been excessively busy and the result has been a general delay in building works. A special push is now being made with the new theatre which is being erected in St. Catherine street a little east of Phillips Square, where formerly stood a Baptist Church. Though not yet far advanced, the completion of this work is required by February 1st. Bennett's theatre, as it is called, is to accommodate an audience of about 1650 people; the division of these being fairly equal between orchestra stalls, balcony and gallery. Fifteen exits are provided. Space is reserved for a promenade foyer. The performances are to be of vaudeville class, and the opening of this theatre may be expected to cause the appearance of sundry restaurants in this part of St. Catherine street. The site, as already stated, was formerly occupied by the first Baptist Church. The next building eastward is the principal Methodist Church of Montreal; just opposite is a Presbyterian Church; and close by are two stores for the sale of religious literature; so the morals of the new arrival should be well looked after. The architect is Mr. Charles E. Horn, the builder Mr. E. E. Horn and Messrs. Lacroix and Piché the local [illegible]

A ten story building is proposed for Messrs Willis & Company, at the corner of St. Catherine and Drummond streets. The new Mount Royal Club house in Sherbrooke street is now completed, and has been in occupation since the 28th of October. The foundation stone of the Church of Messiah, at the corner of Sherbrooke [illegible] was laid on the 22nd of October, and the work is going ahead quickly. Just opposite this the Linton Aparments, which will probably be the largest apartment house in Montreal, is now making a large appearance. The lower portion of the front is of what looks like large blocks of terra cotta with a gray speckled surface. In the present state of the works it is difficult to say what is the particular virtue of this material. The new Emmanuel Church in Drummond street is hastening to get under cover for the winter. The brick employed here is of a pleasant pale drab colour and is from a New York maker.

Discussions have been taking place recently as to the advisability of abolishing the St. Lawrence Market, and establishing a new Technical School upon the site; erecting a ten storey building, with school accommodation above and civic health department below. A high building can hardly be a convenient one for a school, and it would be much healthier for a health department not to shut out the sunlight from its neighbours. The large classes at all evening technical schools, however, show the demand for technical education, and to have a number of such schools in different parts of the city would soon bear fruit in the larger number of intelligent and well trained men. All interested in the satisfactory execution of work, especially in all building trades, would appreciate this.

The value of the new building for which permits are issued falls off at this time of the year, but there is still considerable activity especially in the erection of residential property in the suburban districts. Some of these suburbs, such as Outremont, for instance, can furnish examples to the parent city of how streets and sidewalks can be made and maintained. The city keeps on extending around the Mount Royal in both directions, and this season has seen the rise of a new suburb North Mount, in what might be called the very rear of the hill. The completion and opening of the new race course led to some improvements in the car service on the belt line, and this again is certain to react on the popularity of that side of the hill as a residential part. In fact its pleasant aspect, which is really towards the west, is much in its favour.

The University Lecture of McGill College was this year delivered by Prof. P. E. Nobbs of the Architectural Department. The title given to the address was "Art in its Lowest Terms", and it was largely devoted to a critical comparison of the philosophic theories of aesthetics of Marshall, Tolstoi, Santayana, and Hirn. After indicating the widely different attitudes towards art of these writers, the professor devoted himself to elucidating—by illustrations from architecture, sculpture, poetry and painting—what was the real nature and purpose of art. Art in all its various forms was he said our means of expressing our emotions to one another. They needed some means or vehicle of transmission. For this the appeal though [illegible] more potent than through the reason. The real subject of any work of art is the emotion it endeavors to express. What is usually called the subject of a work of art is really rather the occasion which has been chosen for expressing emotion.

SKETCHING CLUB P. Q. A. A.

On Wednesday, 24th October, the Club held the first of its series of weekly meetings for the winter session, at the Association rooms, No. 5 Beaver Hall Square. The business was the arrangement of the winter programme. The president, Mr. C. S. Burgess, called attention to the fact that during the last season prizes in books to the value of $100 had been awarded to successful competitors.

Mr. W. S. Maxwell, speaking for the committee in charge of the students' competitions, outlined the programme for the coming winter. It is the intention this season to hold, in addition to the advanced series of competitions, a second series for the benefit of beginners in architecture. The "esquisse" principle is to be adopted in the advanced competitions, making it necessary for competitors to be present on those evenings when the subjects are announced.

After the discussion, proceedings were closed pleasantly with refreshments in the Library.

On the 31st October, the first announcements of competitions were made. A special offer having been made to the club of a competitive prize of the value of $25.00, from the Canadian Handicrafts Guild, this competition was announced in lieu of that which had been previously intended for the advanced class. The competition is for the arrangement of a series of bays

to represent summer rooms, at the exhibition of the Guild, at the Art Galleries in Phillips Square, in February next. The rooms are to be arranged specially for the advantageous display of the Canadian Home Industries in which the Guild is interested. The drawings are to be submitted on November 28th. The subject of the Junior competition is an outlook in Greek Ionic style.

On the 7th November, the subject of the programme was a debate "Has L'Art Nouveau had a beneficial influence on Architecture"? Most of the members present had a word to say on the subject, which was dealt with in a lively manner. No vote however was taken, as it was understood that several members were speaking rather as special pleaders than as convinced.

SOME RECENT BUILDING PERMITS IN MONTREAL.

The church of the Messiah, Unitarian, in Sherbrooke street, at the corner of Simpson street; of brick and stone with roof of galvanized iron; to cost about $60,000; contractor, John Quinlan & Company; [illegible]; architects, E. & W. S. Maxwell.

House for H. V. Meredith, in Peel street, near Pine avenue; to be built of pressed brick with gravel and slate roof; to cost $45,000; contractors, Amos Cowen & Company; architects, E. & W. S. Maxwell.

House for Mrs. Lindsay, in Ontario avenue, near Sherbrooke street; of stone and brick; cost $21,000; contractor, Jas. Morrison; architects, Taylor, Hogle & Davis.

House in Pine avenue, near [illegible] for Jas. Walker; of pressed brick with cement and resin roof; cost $18,000; contractor, John Allan; architects, D. R. Brown & Hugh Vallance.

Schoolhouse, corner of Boucher and Drolet streets; of stone and pressed brick; for the Catholic School Commissioners; contractor, D. de Ladurantaye et Fils.

Offices in McGill street for the Canadian Express Company; [illegible] high, in stone and brick with composition roof; [illegible] Hutchison, architects, Hutchison & Wood.

Four houses, forming twelve dwellings; in St. Urban street and Esplanade street, near Rachel street; for Chas. Dagenais; to be of stone and brick; approximate cost $20,000; architect, J. A. Godin.

Factory in Nolan street for Canadian Pacific Railway Company; 672 ft. by 100; of one storey in brick with gravel roof; to cost $70,000; contractors, D.G. Loomis & Sons.

Factory, No. 83 Amherst street; for Wm. Clerk; three stories in brick; 135 ft. 8 in. x 39 ft.; cost $28,000; architect, W. E. Doran.

Factory in Côte St. Paul road, near Acorn avenue; 200 ft. x 50 ft.; 2 stories in brick with cement roof; for Jenkins Bros., Limited; to cost $35,000; architects, D. R. Brown & Hugh Vallance.

Factory in Acorn Avenue; 124 ft. x 64 ft.; for Jenkins Bros., Limited; to cost $30,000; architects, D. R. Brown & Hugh Vallance.

Factory for Messrs. Southam, Limited; in St. Alexander street, near Laganchetière street; 35 ft. x 248 ft.; of brick in two stories, with cement and resin roof; to cost $35,000; architects, D. R. Brown & Hugh Vallance.

Station buildings for Canadian Pacific Railway Company; 176 ft. x 87 ft.; of two stories in concrete with slate roof; cost about $38,000; contractors, D. G. Loomis & Sons.

Warehouse for the Montreal Rolling Mills Company 68 ft. x 60 ft.; three stories in brick with gravel roof; to cost about $25,000; contractor, Geo. W. T. Nicholson.

Extension to Mont St. Louis College, Sherbrooke street east; 100 ft. 6 in. front, 117 ft. 10 in. rear, 60 ft. 6 in. deep; five stories in stone and brick; to cost about $60,000; proprietors, Les Fréres des Ecoles Chrètiennes; contractor, Magloire Huberdeau.

SPONTANEOUS IGNITION OF WOODWORK.*

Next to matches as a cause of accidental fire comes the firing of woodwork by faults in flues or overheating in the vicinity of the fireplace. One would imagine that such a thing as building a beam into a chimney, or laying a joist close under the hearth of a fire-gate, would be so manifest a danger as to insure its never occurring, but such criminal carelessness is by no means so uncommon as one might imagine, and in such cases it is only a question of time and chance for a fire to be caused by it.

A beam, the end of which impinges on the interior of a flue, may be [illegible] above the grate that for years no trouble arises, but the [illegible] of gases in the chimney, [illegible] dust and carbonize the wood, whilst any collection of soot in the chimney catching fire will start a smoldering combustion in the beam that may go on for a considerable time before it gets sufficient air to cause it to break into active combustion.

A more usual source of danger is to be found in the perishing of the mortar used in building the flue, this leaving gaps in the brickwork behind which the wood work is situated. Mortar practically consists of a mixture of slaked lime and sharp sand, and when brickwork has been laid with this, the first hardening of the mortar [illegible] carbon dioxide from air, which converts it into carbonate and causes it to harden, while after the lapse of many years a further action takes place by the silica of the sand acting on the calcium carbonate to from a silicate of great hardness and strength. With modern buildings, however, the first action is the only one that has taken place

The brickwork in the interior of a flue is often very roughly laid, being out of sight, and the bricks, instead of being laid [illegible] with broken bricks and a considerable quantity of mortar. After this has set the action of heat upon it is again to burn the calcium carbonate back to lime, so causing the crumbling down of the mortar, and should a joist have been built-in close to the casing of the flue, hot gases will find their way through the perished mortar to it, and gradually bring about slight carbonization of the wood, and occasionally cause its ignition.

Another fruitful source of danger is to be found in the replacement of one form of grate or fireplace with a new one. For instance, a grate is getting rather old, you determine to have it replaced by one of modern construction, say one of the "well fires." In the old grate the hearthstone was flush with the floor, and under this was a sufficient mass of concrete or mortar amply to protect the joints below from undue heat, You probably buy a new grate from a local ironmonger and intrust him with the job of fixing it, and the old hearthstone and insulating material having been removed to make way for the entirely different structure, the inexperienced workman fails properly to insulate the bottom of the well-grate, with the results that the joists below get overheated.

Dangers of these characters can only be got over by strict supervision during the building of a house, and by intrusting alterations and repairs only to workmen who thoroughly under stand the work which has to be done.

All heating dangers are largely increased, and indeed

*Extract from a lecture by Vivian B. Lewis, Professor Royal Naval College, Greenwich, published in the "Journal" of the Society of Arts.

chiefly exist from the fact that lightly-charred wood becomes almost pyrophoric in its character, and can readily be set on fire at temperatures considerably below those needed to start the combustion of either uncharred wood or charcoal. The changes taking place in wood under the influence of long-continued heating are of a complex and interesting character.

Wood consists mainly of a definite chemical compound called cellulose, a body formed from carbon, hydrogen, and oxygen, and besides cellulose we find wood contains the constituents of the sap and a varying quantity of water. The amount of water present depends upon the season of the year and the portion of the tree from which it is taken, while the percentage is, as a rule, greater in soft than in hard woods, the following table giving and idea of the quantity present in various kinds of wood :

Beach	18.6 per cent.
Oak	34.7 "
Common Fir	32.7 "
Alder	41.6 "
Elm	44.5 "
Poplar	50.6 "

When wood is placed under cover and exposed to the air for about a year the moisture is reduced to about 20 per cent., and the remaining moisture can be got rid of by subjecting the wood to the action of heat, the last portions requiring a temperature sufficient to char the wood. If, however, the wood be heated somewhat below this point the greater part of the moisture is removed, but on again allowing the wood to cool to atmospheric temperatures and exposing it to the air, the hygroscopic nature of the wood gradually attracts moisture until the percentage reaches about 20, at which point a sort of equilibrium is established between the moisture in the air and the wood.

When wood is exposed to the long continued action of heat it undergoes progressive changes nearly akin to those which have taken place during the conversion of vegetation into coal. Up to 100°C. (212°F.) practically only moisture is expelled from the wood, and at a few degrees above this point not only water but volatile hydrocarbons are slowly driven out, while at 150°C. (320°F.) oxides of carbon, together with more hydrocarbons, are disengaged, and slightly above this temperature the wood commences to assume a scorched appearance, and to turn brown. At about 250°C (482°F.) wood is converted into a soft brownish form of charcoal, which is its most dangerous form, being highly pyrophoric and self-igniting at comparatively low temperatures. At 300°C. (572°F.) the carbon begins to assume the appearance of soft black charcoal, getting harder and more metallic in its properties as the temperature increases.

The chemical changes which are taking place in the charcoal at these varying temperatures are strictly shown by the following table.

Temperature.	Carbon.	Hydrogen.	Oxygen.	Ash.
270°C.	71.0	4.60	23.00	1.40
363°C.	80.1	37.1	14.55	1.64
476°C.	85.8	3.13	9.47	1.60
519°C.	86.2	3.11	9.11	1.53

It is seen that as soon as 270°C. is reached the action consists in a gradual increase in the percentage of carbon, owing to the elimination of hydrogen and oxygen, and it is clearly due, therefore, to compounds still containing these three elements in comparatively large proportions that the pyrophoric carbon owes its dangerous character. If the contact of the wood with the heated surface be continued for a sufficiently long period of time, a temperature of a few degrees only above the boiling-point of water is enough to produce a semi-carbonized film on the wood, which will start smouldering at a very low temperature, the heat rising from an oil lamp or gas flame some distance away being sufficient to start the smouldering combustion. Indeed, the temperature of a steam-pipe has been found sufficient to cause ignition, this being due probably to the long-continued heat generating certain hydrocarbons of low ignition point, which remain occluded in the pores of the semi-charred wood, and are there brought into close contact with the occluded oxygen.

It must be remembered that, when using steam heating, although the boiling-point of water at ordinary atmospheric pressure is only 100°C. (212°F.) yet the boiling point rapidly increases with increase of pressure, as is showing by the following table :

Pressure in atmospheres.	Boiling-point. °C.	Pressure in atmospheres.	Boiling-point. °C.
1	100	12	190.0
1.5	112.2	14	197.2
2	121.4	16	203.6
3	135.1	18	209.4
4	145.4	20	214.7
5	153.1	25	226.3
6	160.2	30	236.2
7	166.5	35	244.8
8	171.1	40	252.5
10	181.6	45	265.9

So that in lofty buildings heated either by water or steam it is quite possible to obtain temperatures which will dangerously char wood in contact with the pipes, while with air as the heating medium it is by no means uncommon to find a dull red heat in the pipes and flues near the furnace. Nor does the danger cease when care is taken that the pipes or flues used for these methods of heating are kept several inches away from any woodwork, as in inaccessible places the accumulation of dust on the pipes often gives rise to trouble.

When a hot-water or steam pipe is laid alongside a wall, it will be noticed that where a flange or other projection of a pipe touches the wall there is a brown stain produced on the wall surface streaming upwards from the point of contact and becoming less the farther away it gets from the place where it starts. Experiment shows that this is due to dust settled on the pipe becoming carbonized and ascending with the hot-air current produced by the pipe; this current comes in contact with the surface of the wall and, the ho[illegible] rapidly diffusing [illegible] particles are filtered off, remain on the surface of the wall, and give the stain. When, however, the accumulation of dust is large, the carbonized mass being in a very loose state of aggregation and made up of very minute particles, will often start glowing with a very slight increase of temperature above the ordinary temperature of the pipe.

The fire-risks due to lighting are of a most varied character, even daylight itself not being free from danger, hundreds of fires having been caused by the accidental focusing of the sun's rays by means of a full [illegible] other cause, which has led to the concentration of the sun's rays upon some inflammable substance.

THE DISAPPEARANCE OF LUMBER.

At its recent session in Memphis, Tenn., the National Hardwood Lumber Association heard a committee report that must have been of interest to its members. The committee advised that according to the best available estimates there are now standing in the United States about 1,475,000,000,000 feet of timber, which is being depleted at the rate of 45,000,000,000 feet every year. On this basis, forests now existent would become exhausted in 33 years; but the cutting of timber is not the only agency at work to reduce the available supply. Forest fires, wood for pulp, paper, telegraph poles, cross-ties, piling and fuel, added to the regular cut result in the consumption of about 75,000,000,000 feet every year. A conservative estimate by the lumber experts states that there is not enough timber standing to continue commercially for more than twenty years. Long before the first quarter of the present century is reached, the chief use of lumber will be as an adjunct to concrete in building construction.—*Concrete.*

MANITOBA ASSOCIATION OF ARCHITECTS.

The regular monthly meeting of the Manitoba Association of Architects was held on Friday, Oct. 19th, at which Mr. C. A. P. Turner read to the members an excellent paper on "Reinforced Concrete Construction." Mr. Turner gave illustrations by lantern slides of various methods now used, showing the development of the work from the earliest to the latest system the last of which dispenses with beams of all descriptions, his name for this construction being the "Mushroom System."

It is the intention of the Association to hold similar lectures at each of the monthly meetings, and if each one is an interesting as the last the success of the meetings for the future is assured.

THE USE OF SPRUCE, BALSAM AND POPLAR.

THE CANADA LUMBERMAN was asked to obtain the opinions of the lumber trade on the following questions:

(1) Does balsam make a good shingle?

(2) Does spruce, poplar or balsam make good lath?

(3) Does balsam make good weather boarding?

In submitting the questions the subscriber says: "On account of the growing scarcity of pine and the tendency to bring other woods into use, no doubt others besides ourselves will be pleased to have the opinions. There seems to be, in some parts of the country, a prejudice against these woods for the above purposes, whereas in other parts they are accepted as first class material."

The answers received are given below, the numbers corresponding to the numbers prefixed to the questions.

(1) I think that balsam would make a very poor shingle.

(2) Balsam and spruce make very good lath, but of course not as good as pine. Poplar I do not know anything about.

(3) Balsam would make fairly good weather-boarding but not nearly as good as white pine, as it is very apt to rot in any place where there is dampness and would not stay to its place as well as pine. I think the sun would curl it where there would be any chance. Balsam and spruce rot a great deal quicker than white pine.

---

(2) The only question we can speak on with authority is No. 2. We believe that balsam is equally as good a lath as pine. It won't stain plaster, won't twist and nails well. We have had a few balsam lath in our office for nearly a year and they are still white and as straight as an arrow. While spruce makes a good lath, we do not like them as well as balsam.

---

(1) I do not think balsam shingles would be much use for the reason that the black knots in balsam will drop out when the timber gets dry.

(2) Both spruce and balsam make good lath, especially balsam owing to the texture of the wood being softer than spruce; as to poplar, would say I have not seen any of these lath but think this class of wood would be very suitable, as it is taking the place of pine in some cases for door and sash work, and is considered to be almost as good.

(3) I would think that balsam would not be very good lumber for weather boards for the same reason as applies to shingles.

---

(2) We think that spruce would make good lath, and we understand that in the Eastern States they would just as soon have them as white pine.

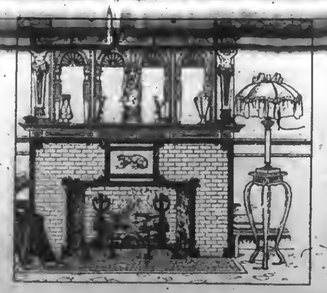
---

(1) We have never seen shingles made out of balsam and don't think this wood would make good shingles, for being very much of the same nature as spruce and a good deal harder than pine or cedar, it would warp.

ARTISTIC FIRE PLACES

Properly Secured with Ornamental Iron Frames
Make a Handsome Finish to Any Room

Fire Dogs
Fenders
Screens
Smoke Guards



Interior Metal Work of Every Kind and Finish.

SEND FOR BULLETIN NO. 20.

CANADA FOUNDRY CO., Limited

Head Office and Works: TORONTO, ONT.

District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

(2) Spruce, poplar and balsam are all right for lath, but of course not so good as pine. Still we think that if the trade were not so prejudiced in favor of pine these woods could be used in lath satisfactorily to a great deal larger extent than they are.

(3) Balsam we think would not make good weather boarding for the same reason that we think it would not make good shingles, it would be too apt to warp.

---

(1) We think balsam would be useless for making shingles, for the reason that its lasting qualities are exceptionally poor where there is any dampness.

(2) I presume any of the three woods mentioned would make satisfactory lath, as they would always be dry.

(3) I would not want to use balsam for any work where it was exposed to the weather, but for flooring or other purposes where it was not exposed, I think it would be quite satisfactory.

---

(1) Would say not, owing to its warping in the sun so readily and it would decay very early.

(2) Spruce or balsam would no doubt make very fair lath. It would certainly be apt to split readily with the nails and probably cost more for putting on.

(3) No. For the same reason that it would warp as in shingles, and it is very short lived, that is, it would possibly decay inside of four or five years.

---

(1) We have never seen or handled any balsam shingles as they have been used at all it has probably been in back country villages and the product of small mills. Their value can only be determined by the test of experience.

(2) Spruce makes a very good lath. We do not know anything of poplar or balsam, and do not think these woods have ever been manufactured into lath. The spruce lath now on the market comes almost entirely from Quebec, as Ontario spruce does not grow large enough to make any quantity of lath.

(3) We have never seen balsam used for weather boarding It is very frequently, perhaps unsually, mixed with spruce when sold in the wholesale market. The percentage of balsam handled in this way is small. Whether or not balsam will make good weather boarding can only be determined by the test of experience. We do not feel competent to express an opinion on this merely from a knowledge of the wood. Like balsam shingles, it might be possible to find evidence in regard to these woods in backwoods villages near small mills.

---

(1) Emphatically No.

(2) Spruce, good; balsam, fair; and poplar, doubtful.

(3) Balsam is a soft spongy wood, with very little life in it at any time, and on that account it is very easily destroyed by exposure to the weather, and I would not hesitate to condemn it as a weather board, but if balsam were used as matching for inside work, such as summer cottages, and a good quality of lumber is used for such purposes, I would not hesitate to recommend it as a good cheap material.

---

(1) It has no lasting qualities when exposed to the weather.

(2) Only fair.

(3) No, for the same reason as outlined in 1. It would, however, have a tendency to last longer if well painted.

---

(1) I would not think that balsam timber would answer for shingles at all, as this timber rots very fast and would only last for a few years.

(2) I do not see any reason why spruce, poplar and balsam would not make good lath, and they should make lath superior to hemlock lath, being stronger and not so liable to break.

(3) I would not think that balsam would make good weather boarding, as it is so liable to decay quickly, and I understand that it does not hold the paint well.

---

(1) I do not consider that balsam makes a good shingle.

(2) Spruce, poplar or balsam makes a fairly good lath.

(3) Balsam does not make a good weather board, it wears

The Locomotive and Machine Company

OF MONTREAL, LIMITED

Works of the Locomotive and Machine Co., of Montreal, Limited, during process of construction. Structural Steel by the Company's Structural Steel Plant.

NEW YORK OFFICE 111 Broadway, N.Y.

Structural Steel For All Purposes.

WORKS Long Point, Montreal

Principal Office, IMPERIAL BANK BUILDING, MONTREAL

quicker than spruce or pine as it is much softer and not so strong, but I presume under paint would be better.

---

(1) I might say that I have never handled any balsam shingles and do not think that they would give satisfaction, as balsam is a wood that, when exposed to the weather as a shingle is, is bound to warp and crack.

(2) Yes. Lath have been manufactured from these woods for some time and they give good satisfaction. While not equal to white pine, they are a very good substitute when pine is scarce.

(3) I know of a house in Leamington that was sided with spruce and balsam thirteen years ago and painted at that time. This house was examined a few weeks ago and found to be still in good shape. The siding had not rotted whatever and all it needed was some more paint to make it look as good as ever.

---

(1) Assuming that balsam to which you refer is indentical with with our fir, we reply, yes.

(2) Spruce and balsam make good lath; we have never known poplar to be cut into lath, but, as it is a tough, strong wood when dry, we assume it would make good lath.

(3) Assuming, as above, that balsam is identical with our fir, yes. The fiber of fir or balsam is not as strong as spruce, but is yet of fair atrength and when dry is a good wearing wood. As to the wearing qualities of balsam as a shingle, we do not imagine they are equal in quality to spruce or pine, as it is a lighter wood and we assume would wear out by exposure more quickly.

---

(1) Balsam does not make a good shingle, it has not the lasting qualities.

(2) Spruce and poplar make a fairly good lath. Balsam not so good.

(3) Balsam makes very good weather boarding.

---

(1) Balsam does not in my opinion make a good shingle. The wood is shaky and does not stand the weather.

(2) Spruce, balsam and poplar make a fairly good lath. However, I would prefer the spruce to the balsam and poplar, and would not care to use either of the latter in a house were I owner of it.

(3) No shaky lumber stands well to the weather, and for that reason balsam does not make a good weather board. It also warps very easily, which would make it unfit for that use.

---

(1) We have not had experience with balsam, either as a shingle or as weather boarding. It does not appeal to us as being a satisfactory wood for either purpose.

(2) In regard to spruce lath, we may say that the Boston and New York architects specify that spruce lath must be used in preference to other lath. They are in general use throughout the United States. We have never used poplar or balsam lath.

---

(1) We have never known balsam shingles to be used and cannot say how they will last, but our opinion is that they will rot quickly.

(2) Balsam makes very good lath and good weather boarding if it is kept painted. In some sections the spruce is harder than others. Soft spruce makes good lath but the hard spruce is not so good. We have not had any experience with poplar lath, but we believe good poplar will make good lath.

Mr. Carnegie told a story of a Presbyterian minister who had been bold enough to introduce the hated innovation of stained glass. He was showing it in triumph to one of his parishioners, and asked her how she liked it.

"Ay, it is handsome," said she, sadly, "but I prefer the gless jist as God made it."

"We hear some strange things in this office sometimes," said the superintendent of sewers.

"One of our inspectors went one day to inspect an old house in the country. There was a good deal of smell about the old place. The inspector walked about sniffing.

"'Dear me,' he said, 'what an unpleasant odor. Can it be the drains?'

The owner of the house shook his head positively.

"It can't be the drains," he said, "because there ain't none."

Householders Know What "Standard" Stands For

In the public mind "Standard" and Sanitation are Synonymous terms. Whenever you specify "Standard" Porcelain Enameled Fix- Hotel or Apartment House you are assuring the owner that he will receive what he recognizes as the best in the way of sanitary equipment.

"Standard" Porcelain Enameled Sink, with apron all around, enameled sink legs with wall supports, nickel-plated strainer, Fulier adjustable flange bibbs and "P" trap with waste and vent to wall with or without bibbs and trap.

Standard Sanitary Mfg. Co. Pittsburgh, Pa., U. S. A.

(2) Spruce, poplar and balsam are all right for lath, but of course not so good as pine. Still we think that if the trade were not so prejudiced in favor of pine these woods could be used in lath satisfactorily to a great deal larger extent than they are.

(3) Balsam we think would not make good weather boarding for the same reason that we think it would not make good shingles, it would be too apt to warp.

---

(1) We think balsam would be useless for making shingles, for the reason that its lasting qualities are exceptionally poor where there is any dampness.

(2) I presume any of the three woods mentioned would make satisfactory lath, as they would always be dry.

(3) I would not want to use balsam for any work where it was exposed to the weather, but for flooring or other purposes where it was not exposed, I think it would be quite satisfactory.

---

(1) Would say not, owing to its warping in the sun so readily and it would decay very early.

(2) Spruce or balsam would no doubt make very fair lath. It would certainly be apt to split readily with the nails and probably cost more for putting on.

(3) No. For the same reason that it would warp as in shingles, and it is very short lived, that is, it would possibly decay inside of four or five years.

---

(1) We have never seen or handled any balsam shingles; if they have been used at all it was probably been in back country villages and the product of small mills. Their value can only be determined by the test of experience.

(2) Spruce makes a very good lath. We do not know anything of poplar or balsam, and do not think these woods have ever been manufactured into lath. The spruce lath now on the market comes almost entirely from Quebec, as Ontario spruce does not grow large enough to make any quantity of lath.

(3) We have never seen balsam used for weather boarding. It is very frequently, perhaps unsually, mixed with spruce when sold in the wholesale market. The percentage of balsam handled in this way is small. Whether or not balsam will make good weather boarding can only be determined by the test of experience. We do not feel competent to express an opinion on this merely from a knowledge of the wood. Like balsam shingles, it might be possible to find evidence in regard to these woods in backwoods villages near small mills.

---

(1) Emphatically No.

(2) Spruce, good; balsam, fair; and poplar, doubtful.

(3) Balsam is a soft spongy wood, with very little life in it at any time, and on that account it is very easily destroyed by exposure to the weather, and I would not hesitate to condemn it as a weather board, but if balsam were used as matching for inside work, such as summer cottages, and a good quality of lumber is used for such purposes, I would not hesitate to recommend it as a good cheap material.

---

(1) It has no lasting qualities when exposed to the weather.

(2) Only fair.

(3) No, for the same reason as outlined in 1. It would, however, have a tendency to last longer if well painted.

---

(1) I would not think that balsam timber would answer for shingles at all, as this timber rots very fast and would only last for a few years.

(2) I do not see any reason why spruce, poplar and balsam would not make good lath, and they should make lath superior to hemlock lath, being stronger and not so liable to break.

(3) I would not think that balsam would make good weather boarding, as it is so liable to decay quickly, and I understand that it does not hold the paint well.

---

(1) I do not consider that balsam makes a good shingle.

(2) Spruce, poplar or balsam makes a fairly good lath.

(3) Balsam does not make a good weather board, it wears quicker than spruce or pine as it is much softer and not so strong, but I presume under paint would be better.

---

(1) I might say that I have never handled any balsam shingles and do not think that they would give satisfaction, as balsam is a wood that, when exposed to the weather as a shingle is, is bound to warp and crack.

(2) Yes. Lath have been manufactured from these woods for some time and they give good satisfaction. While not equal to white pine, they are a very good substitute when pine is scarce.

(3) I know of a house in Leamington that was sided with spruce and balsam thirteen years ago and painted at that time. This house was examined a few weeks ago and found to be still in good shape. The siding had not rotted whatever and all it needed was some more paint to make it look as good as ever.

---

(1) Assuming that balsam to which you refer is indentical with with our fir, we reply, yes.

(2) Spruce and balsam make good lath; we have never known poplar to be cut into lath, but, as it is a tough, strong wood when dry, we assume it would make good lath.

(3) Assuming, as above, that balsam is identical with our fir, yes. The fiber of fir or balsam is not as strong as spruce, but is yet of fair strength and when dry is a good wearing wood. As to the wearing qualities of balsam as a shingle, we do not imagine they are equal in quality to spruce or pine, as it is a lighter wood and we assume would wear out by exposure more quickly.

---

(1) Balsam does not make a good shingle, it has not the lasting qualities.

(2) Spruce and poplar make a fairly good lath. Balsam not so good.

(3) Balsam makes very good weather boarding.

---

(1) Balsam does not in my opinion make a good shingle. The wood is shaky and does not stand the weather.

(2) Spruce, balsam and poplar make a fairly good lath. However, I would prefer the spruce to the balsam and poplar, and would not care to use either of the latter in a house were I owner of it.

(3) No shaky lumber stands well to the weather, and for that reason balsam does not make a good weather board. It also warps very easily, which would make it unfit for that use.

---

(1) We have not had experience with balsam, either as a shingle or as weather boarding. It does not appeal to us as being a satisfactory wood for either purpose.

(2) In regard to spruce lath, we may say that the Boston and New York architects specify that spruce lath must be used in preference to other lath. They are in general use throughout the United States. We have never used poplar or balsam lath.

---

(1) We have never known balsam shingles to be used and cannot say how they will last, but our opinion is that they will rot quickly.

(2) Balsam makes very good lath and good weather boarding if it is kept painted. In some sections the spruce is harder than others. Soft spruce makes good lath but the hard spruce is not so good. We have not had any experience with poplar lath, but we believe good poplar will make good lath.

Mr. Carnegie told a story of a Presbyterian minister who had been bold enough to introduce the hated innovation of stained glass. He was showing it in triumph to one of his parishioners, and asked her how she liked it.

"Ay, it is handsome," said she, sadly, "but I prefer the glass just as God made it."

"We hear some strange things in this office sometimes," said the superintendent of sewers.

"One of our inspectors went one day to inspect an old house in the country. There was a good deal of smell about the old place. The inspector walked about sniffing.

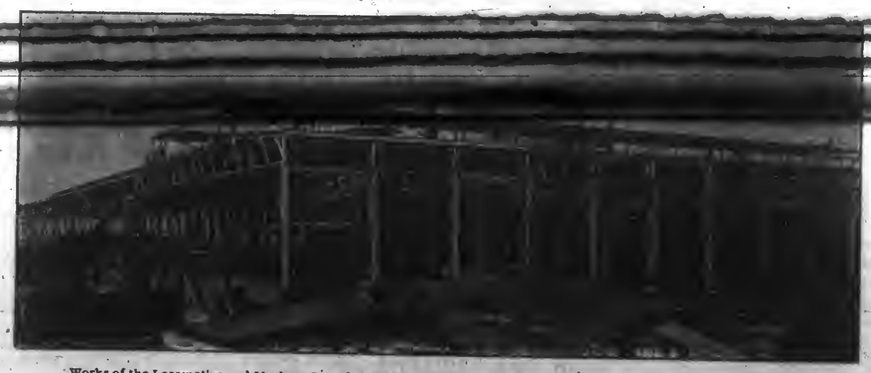
"'Dear me,' he said, 'what an unpleasant odor. Can it be the drains?'

The owner of the house shook his head positively.

"It can't be the drains," he said, "because there ain't none."

The Locomotive and Machine Company

OF MONTREAL, LIMITED



Works of the Locomotive and Machine Co., of Montreal, Limited, during process of construction. Structural Steel by the Company's Structural Steel Plant.

NEW YORK OFFICE 111 Broadway, N.Y.

Structural Steel For All Purposes.

WORKS Long Point, Montreal

Principal Office, IMPERIAL BANK BUILDING, MONTREAL

Housewners Know What "Standard" Stands For

In the public mind "Standard" and Sanitation are Synonymous terms. Whenever you specify "Standard" Porcelain Enameled Fix-

Hotel or Apartment House you are assuring the owner that he will receive what he recognizes as the best in the way of sanitary equipment.

"Standard" Porcelain Enameled Sink, with apron all around, enameled sink legs with wall supports, nickel-plated strainer, Fuller adjustable flange bibbs and "P" trap with waste and vent to wall with or without bibbs and trap.

Standard Sanitary Mfg. Co. Pittsburgh, Pa., U. S. A.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited Publishers,

Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

Room B 34 BOARD OF TRADE BUILDING, MONTREAL.
Bell Telephone 2090.
720-721 UNION BANK BUILDING, WINNIPEG.
DAVIS CHAMBERS, HASTINGS STREET, VANCOUVER, B. C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

ADVERTISEMENTS.

Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publishers of any irregularity in delivery.

ONTARIO ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	EDMUND BURKE, Toronto
1ST VICE-PRESIDENT	W. A. LANGTON, "
2ND VICE-PRESIDENT	JOHN E. BEECHER, Peterborough
TREASURER	H. B. GORDON, "
REGISTRAR	W. R. GREGG, 25 King St., Toronto

COUNCIL:

[illegible] GRAY	Toronto
J. W. H. WATTS	Ottawa
A. H. GREGG	Toronto

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

OFFICERS FOR 1906.

PRESIDENT	[illegible]
1ST VICE-PRESIDENT	R. P. LEMAY, Quebec.
2ND VICE-PRESIDENT	[illegible]
SECRETARY	J. E. VANIER
TREASURER	[illegible]

COUNCIL.

J. ARCHIBALD, PAST PRESIDENT	Montreal
[illegible]	Quebec
[illegible]	Montreal.
C. B. BURGESS	Montreal.
D. N. MACVICAR	Montreal.

AUDITORS—A. R. DECARY AND C. DUFORT.

ALBERTA ARCHITECTS' ASSOCIATION.

PRESIDENT	F. DEGENDORFER, Edmonton.
1ST VICE-PRESIDENT	J. LLEWELLYN WILSON, Calgary.
2ND " "	J. A. MACDONALD, Lethbridge.

COUNCIL

H. D. JOHNSON	Edmonton.
E. C. HOPKINS	Edmonton.
GILBERT HODGSON	Calgary.
W. S. WILLIAMS	Medicine Hat.
JAMES E. WISE	Edmonton.
R. G. GORDON	Calgary.

REGINA ARCHITECTURAL CLUB.

PRESIDENT	W. W. HILTON.
VICE-PRESIDENT	F. CHAPMAN CLEMESHA.
SECRETARY-TREASURER	W. B. VANEDMOND.

COMMITTEE

J. H. Puntin. A. C. Barrett. Ernest E. Carver.

TORONTO BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

TEROTE DUTHIE, President.	H. MARTIN.
JHOS W. SELF, 1st Vice-President.	THOS. CHRISTIE.
G. W. PATT, 2nd Vice-President.	J. R. HOLDOR.
CAS. CRANG, Treasurer.	JOHN ALDSIDOR.
	JOHN MALONEY.

Exhibition Board—RICHARD G. KIRBY.
Auditors—G. CLAY AND F. HOLMES.

LONDON BUILDERS' EXCHANGE

BOARD OF DIRECTORS:

GEORGE C. YOUNG, President.	J. JONES.
JNO. WHITTAKER, 1st Vice-President.	CHAS. GOULD.
GEO. HYATT, 2nd Vice-President.	T. WRIGHT.
GEO. S. GOULD, Secretary-Treasurer. 471 English St.	H. STRATFOLD.
	A. NOBES.

VANCOUVER BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

E. COOK, President.	C. P. SHINDLER
E. A. CARTER, Secretary.	K. M FRASR
H. A. BELL, Treasurer.	E. G. BAYNE
T. BRADERY	D. SAULT

WINNIPEG BUILDERS' EXCHANGE.

A. T. DAVIDSON, President.	A. E. PORTER, Secretary.
J. W. MORLEY, 1st Vice-President.	T. D. ROBINSON, Treasurer.
T. E. DEACON, 2nd Vice-President.	

Directors: Thos Black, Jos. Bourgeault, E. Cass, D. Cameron, V. L. Bouch, Wm. Alsip, Ald. J. G. Laliner, G. W. Murray, C. H. Simpson, Frank Powell, Jas. A. Payne, W. P. Alsip.

MONTREAL BUILDERS' EXCHANGE.

BOARD OF DIRECTORS

R. GEORGE HOOD, President.	JOHN DUTHIE.
JOS. O. DESLAURIERS, Vice-President.	JOHN L. HARRINGTON
J. HERBERT LAUER, Secretary.	JOHN GRAY.
N. T. GAGNON, Past President.	ALEX. BREMNER.
W. E. RAMSAY. J. LEFEBVRE.	J. N. ARCAND.
W. P. SHAW.	JOS. THIBEAULT.

VICTORIA BUILDERS' EXCHANGE, VICTORIA, B.C.

BOARD OF DIRECTORS:

W. D. MCKILLICAN	Chairman
H. W. WHITTINGTON	Secretary
THOS. CATTERALL	Treasurer

CHAMBRE SYNDICATE DE LA CONSTRUCTION.

(French Builders' Exchange.)
8 St. James Street, Montreal.

BOARD OF DIRECTORS.

J. B. GRATTON, President	FELIX SAURAGEAU.
G. MENARD, 1st Vice-President.	L. Z. MATHIEU.
T. CHAPENTIER, JR., 2nd Vice-President.	H. CONTANT.
ALCIDE CHAUSSE, Treasurer.	E. COTE
N. T. GAGNON, Secretary.	LOUIS PAYETTE.

The Don Valley Brick Works

POROUS TERRA COTTA FIREPROOFING

IN ARCHES, BLOCKS AND FURRING

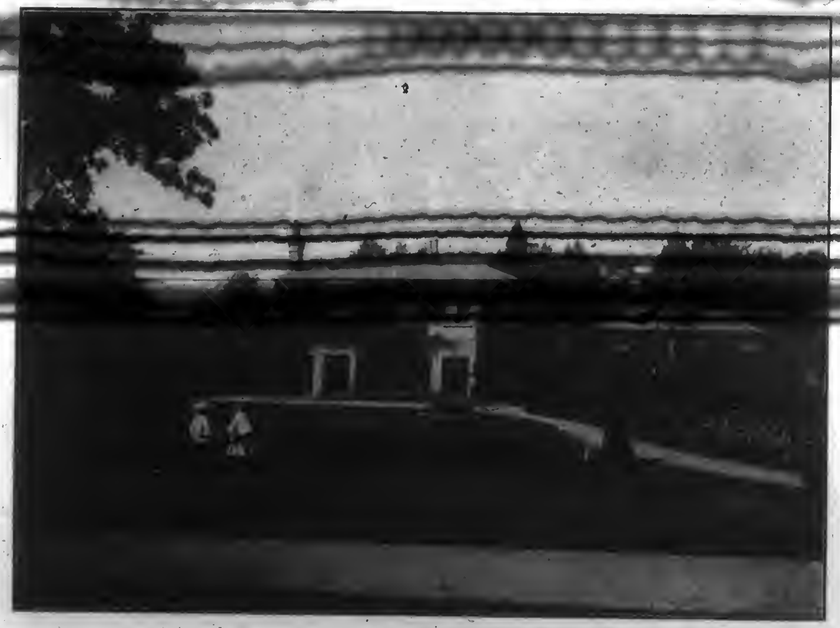
in any required size.

HEAD OFFICE:
36 Toronto Street, TORONTO

MONTREAL AGENTS:
DAVID McGILL
206 Merchants Bank Chambers, MONTREAL

Kindly Write for Prices

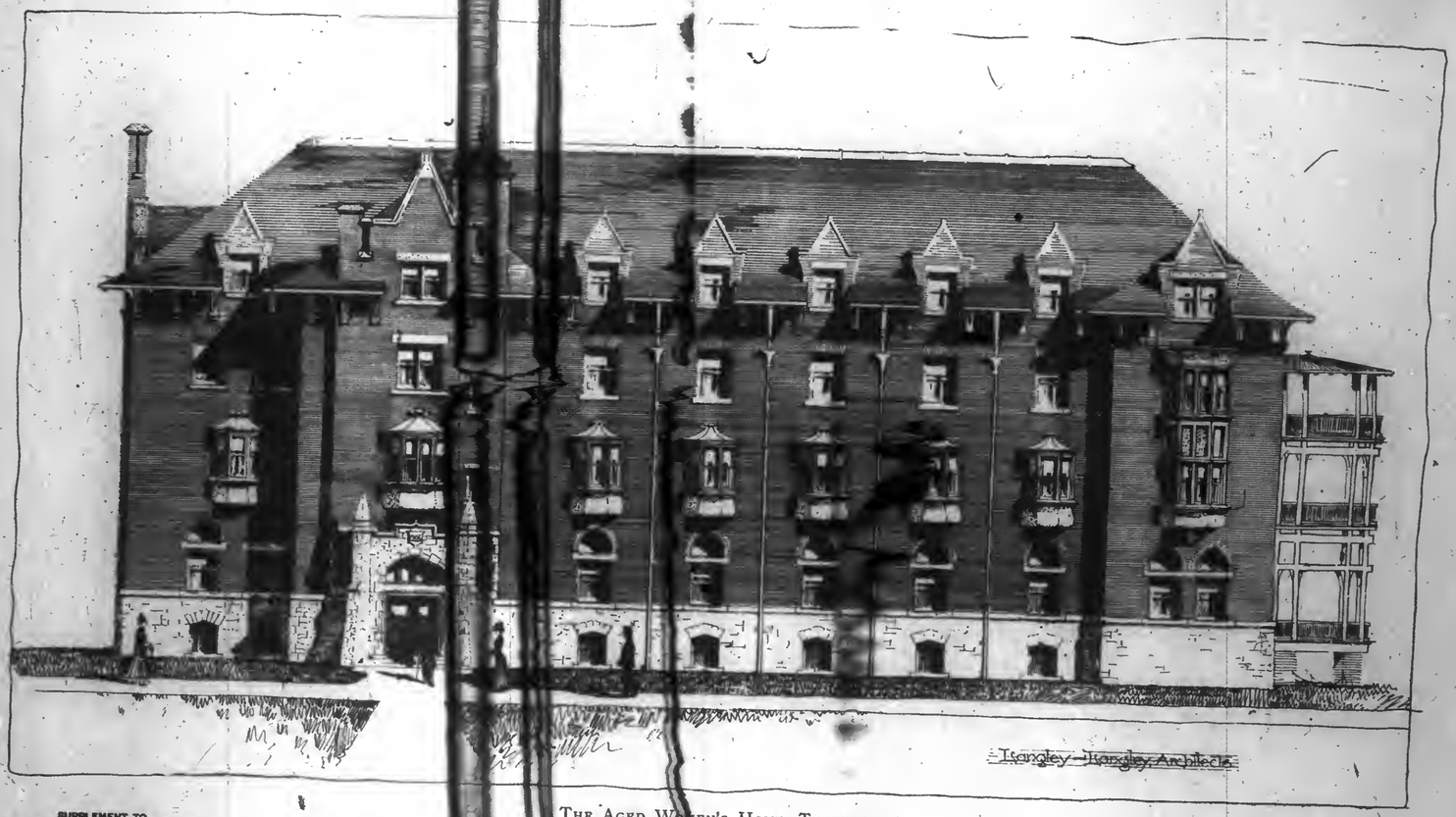
SHELTERED WALK.



GARDEN FRONT.

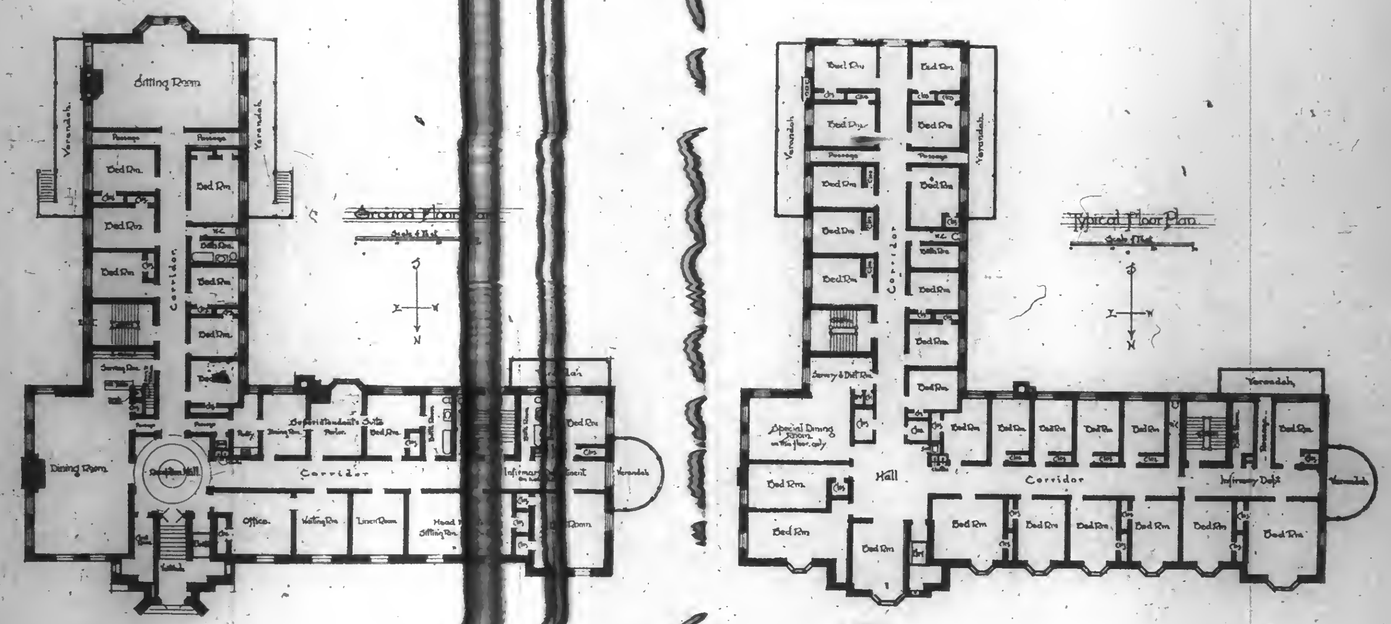
DOCKLANDS, INGATESTONE, ESSEX, ENG.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1906



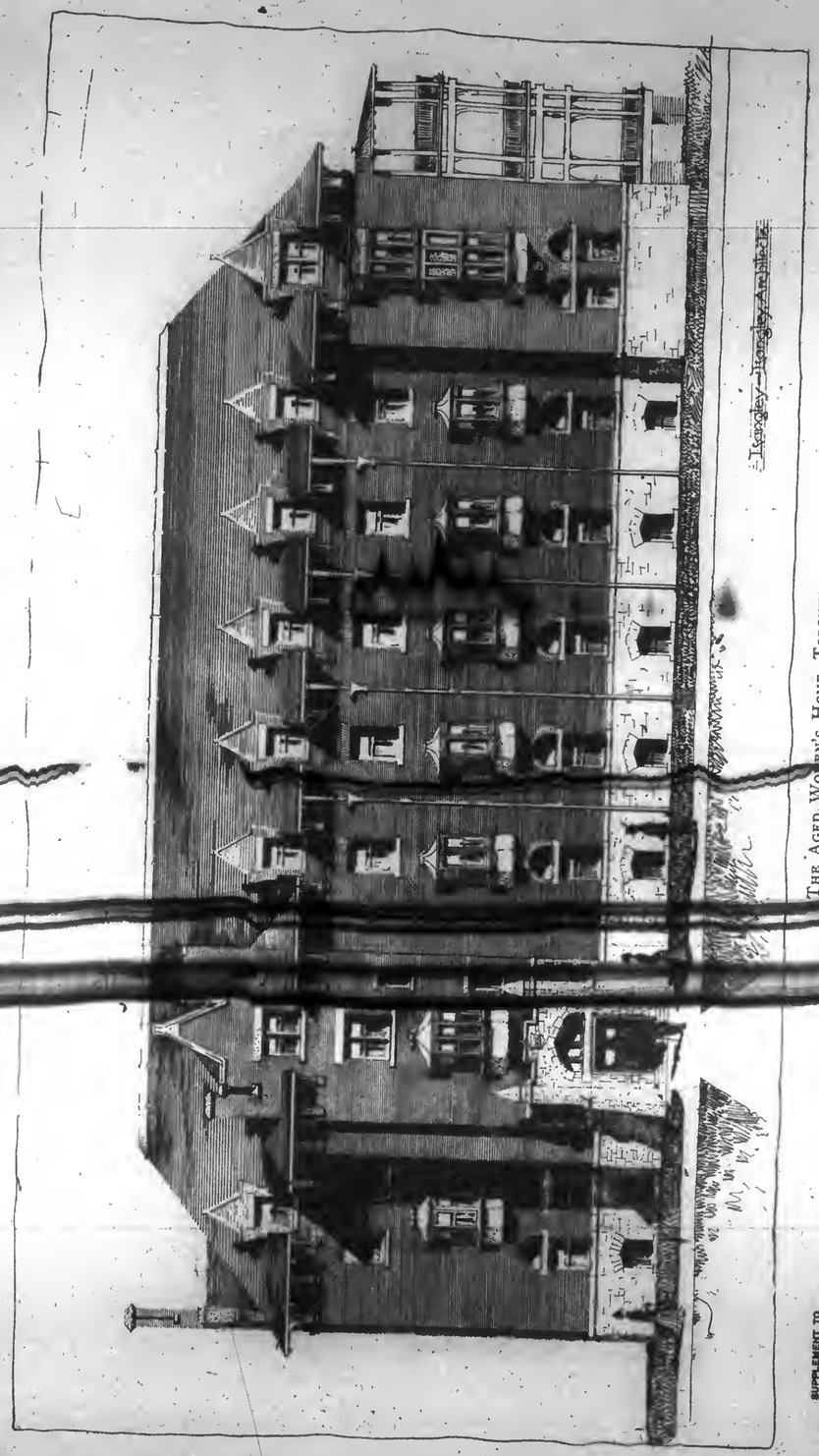
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1906

THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
FRONT.

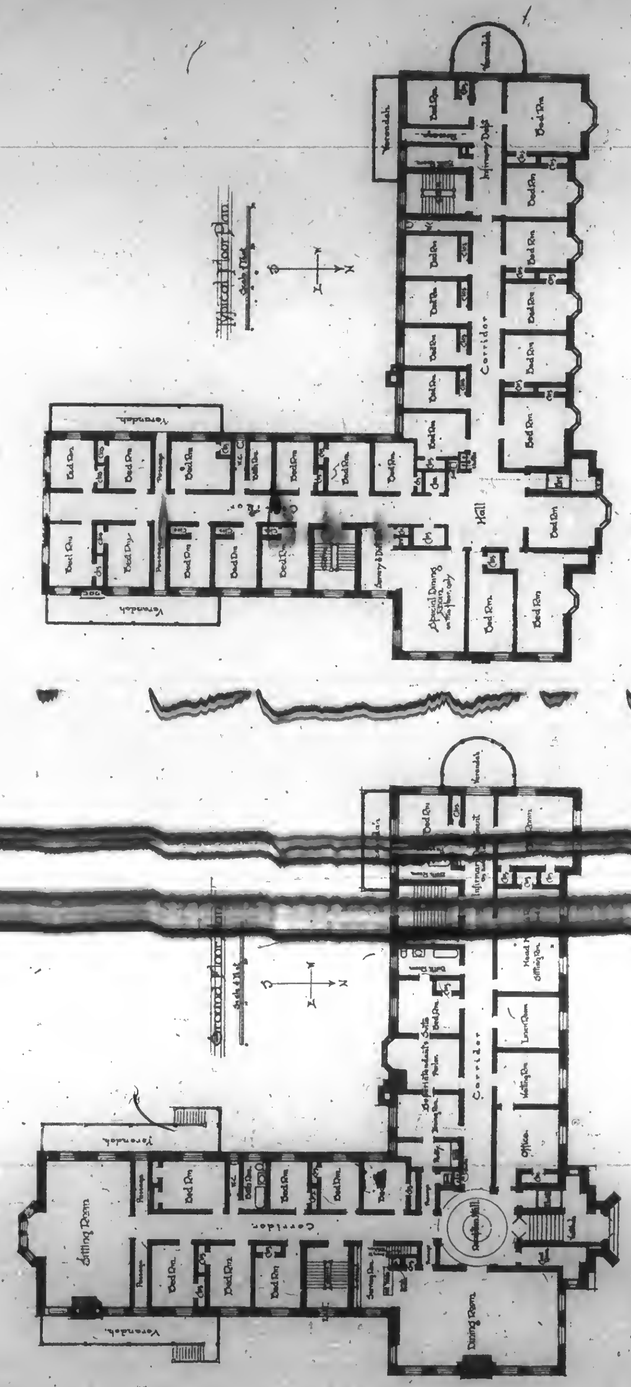


SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER.
NOVEMBER, 1906

THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
PLANS.



THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
FRONT.



THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
PLANS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1906

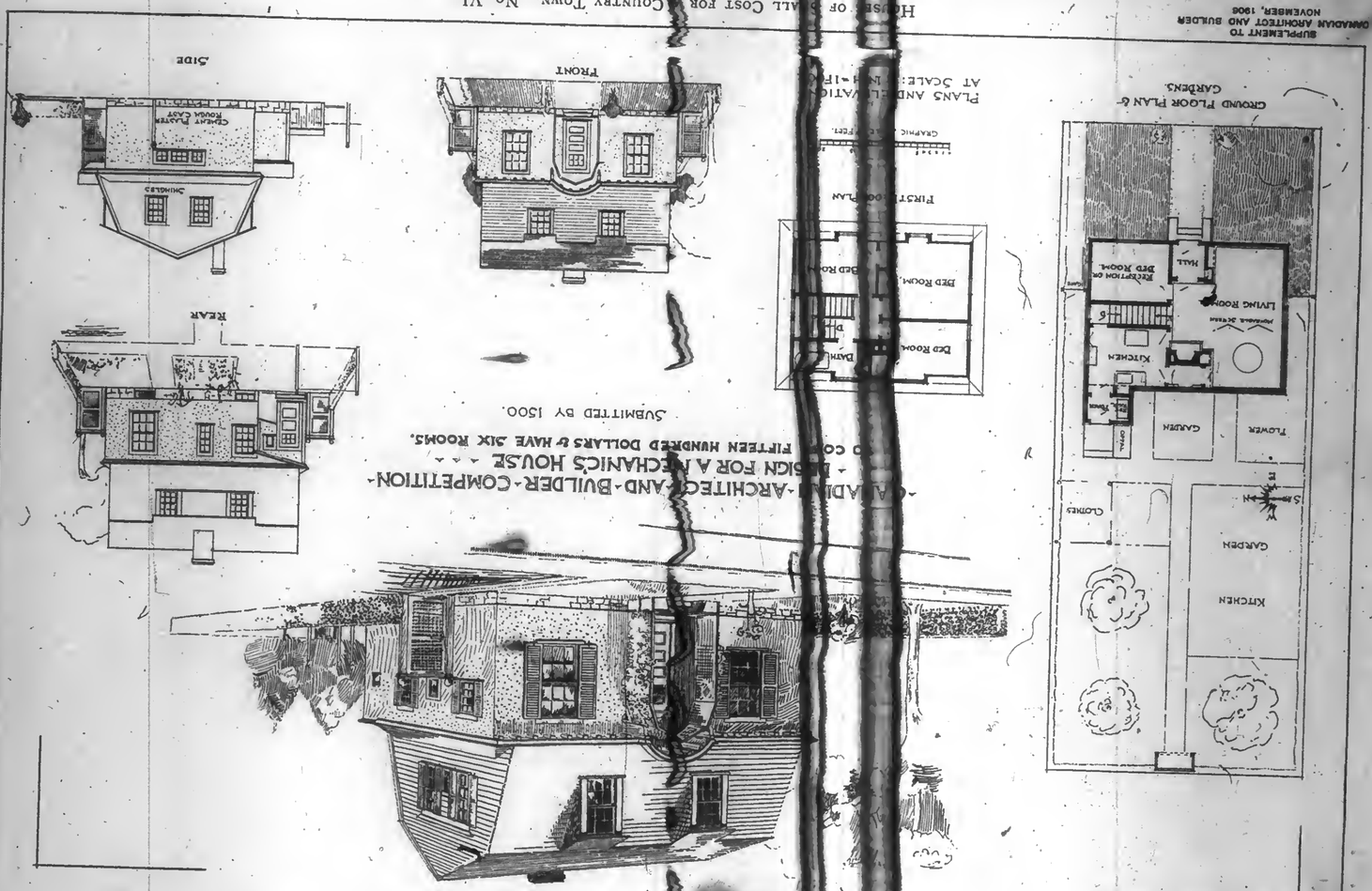
HOUSES OF SMALL COST FOR A COUNTRY TOWN. No. VI.

-CANADIAN-ARCHITECT-AND-BUILDER-COMPETITION-

- DESIGN FOR A MECHANIC'S HOUSE -

COST FIFTEEN HUNDRED DOLLARS & HAVE SIX ROOMS.

SUBMITTED BY 1500.



The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XIX.—No. 228. DECEMBER, 1906.

ILLUSTRATIONS ON SHEETS.

McGill College Students' Union, Percy E. Nobbs, M. A., and Messrs. Hutchison & Wood, Montreal, Conjoint Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House for Duncan Macdonald, Esq., Toronto, Messrs. Bond & Smith, Architects, Toronto.

CONTENTS

Editorial	177	Design for Moderate Cost House	189
Building for the year	178	Manitoba Association of Architects	190-191-192
Montreal Notes	179	Architectural Eighteen Club	ix
Sketching Club, P. Q. A. A.	180	Canadian Architect and Builder Students' Competitions	x
Students' Competition	180	Toronto Marble Workers and Stone Dealers Dissatisfied	x
Our Illustrations	181	Personal	xi
Montreal Builders' Exchange	182-183-184-185	C. A. & B. Competition for Advertisement Designs	xii
Canadian Clay Products Manufacturers	186-187	Successful Draftsmanship	xii
Grogs in Brick Making	188	Publications	xiii

NOTICE TO SUBSCRIBERS

On the first of January, 1907, the price of the Regular Edition of the CANADIAN ARCHITECT and BUILDER (without the Weekly Contract Record) will be reduced to $1.00 per year, and the price of the Architects' Edition (without the Weekly Contract Record) will be reduced to $2.00 per year. This reduction in price has been decided upon for the benefit of such of our subscribers as may not be interested in or benefited by the information published in the Weekly edition, the Contract Record. Those subscribers who wish to receive the Weekly Contract Record, as well as the monthly edition, the ARCHITECT and BUILDER, will be charged the same prices as heretofore.

A number of changes and improvements will be introduced with the January number, such it is hoped as will meet with the approval and appreciation of our readers. An earnest effort will be made to present in the pages of each number of the ARCHITECT and BUIDER, the latest and most helpful information concerning every department of the building business. The co-operation of subscribers is invited for this object. Questions and expressions of opinion, etc., will always be welcomed, and will tend to add interest to the publication.

Elevator Inspection. There have been two serious elevator accidents in Toronto, recently. One, a simple case of a broken [illegible] let the cage drop to the botton, seems to point clearly [illegible] the law requires an initial inspection, which guarantees sound installation; but maintenance in good order is left to the individual. When we reflect on the continual jerking to which the rope is subjected; on its constant bending and straightening as it passes over the wheel; there is reason to suspect such molecular changes in the structure of the steel wire of which the rope is made, that its tenacity may be much reduced without there being any change in the external appearance. On this point alone—and it is not alone in the risks to which we are subjected from the deterioration of elevator mechanism—it is reasonable to want some guarantee of permanence. And we should have it soon, for it is about now that the first symptoms of age must be showing themselves in many elevators.

Trade Schools. The treatment of this question. at the banquet of the Builders' Exchange in Montreal, and in the comments upon it in our Montreal Notes, will be read with interest. The country is ready for this question, not merely, as is sometimes said, as an unavoidable substitute for apprenticeship, but as an improvement upon that system. The apprenticeship process was too indirect for our day. A boy wasted too much of his time in the manual occupations by which he paid for the privilege of learning to do what he saw done in his trade. The method was doubtful, and the result was not sufficient, It is not only what is done that a boy should learn in his trade, but what ought to be done. This is where the trade school will excell the old system, and suit better the perpetual tendency to new methods, which is characteristic of our time.

Ontario Association of Architects. It is likely that the Convention of the Ontario Asssociation of Architects, which is to be held this year at Ottawa, will for that reason be more than usually important. The dinner, to which we understand Earl Grey is invited, is intended to be especially interesting. As to the papers Mr. W. L. Price, of Philadelphia and Prof. Nobbs, of McGill University, are speakers sure to present valuable matter in an attractive way. Prof. Nobbs, remarks, at a meeting of the Sketching Club Club of the P. Q. A. A., indicate that his paper will deal with perhaps the most important subject that can be presented to architects—our own style. The will be also discussion upon the question [illegible] and a demonstration, by a member of the Geological [illegible] There will be an exhibition of drawings by members, [illegible] for a few years past. Outside the meetings, there is much to be seen, under the guidnace of the Ottawa Chapter. There are the buildings and the city improvements, in which Ottawa is giving a lead to other places. There is the site of the new Goverment buildings on Major's Hill. The conditions of competition are only just issued; the time for the competition is extended, and the Convention will be in time to allow intending competitors to make a thorough study of the site. More than this, (and this is one reason why we are so carefully setting forth the advantages of attending this Convention), there is still time to procure a change in the condition which puts the execution of the work in the hands of the Public Works Department instead of in that of the premiated designer—and *this Convention ought to procure that change, and should be well attended for the purpose.* Clause 13, of the condition, regarding questions and further information, may be made to give an opening for a new settlement of clause 12, which excludes the successful designer from taking part in carrying out his work. The 15th, day of January, the opening day of the Convention—is the last day for sending in such questions. The Convention is just in time and the question, whether that condition should not be changed, ought to come in the form of protest from the Convention.

BUILDING FOR THE YEAR.

A general review of the progress of building in Montreal will be found in our Montreal Notes, following this.

In Toronto the total value of building permits for the past eleven months is $12,940,614.75. In 1905 the total value for the year was $10,347,915. Allowing for the slackness of December in building matters by estimating the permits at $500,000, which is less than one-half of the value of permits for November, the total increase for the year will be well over three million dollars.

It is interesting to see how the amount for the eleven months is made up. Not to make too exhaustive an analysis, we may set down the values of some of the leading classes of buildings, so as to compare them:

	No. Permits.	Value.
Brick dwellings	2,013	$6,035,040
Additions to brick dwellings	105	108,135
Frame dwellings	192	217,750
Roughcast dwellings	413	392,360
Additions to roughcast dwellings	274	85,132
Brick fronts with roughcast	656	1,086,225
Brick veneered dwellings	77	135,875
Cement block houses	2	4,400
Stables	143	154,302
Verandahs	167	29,822
Churches	19	360,300
Sunday Schools	4	40,000
Hotels	13	135,500
Clubhouses	6	150,450
Stores and Offices	207	809,455
Warehouses	22	214,825
Factories	32	324,950
Banks	12	171,500
Charitable institutions	4	113,000

These are the buildings numerous enough of one kind to form a class. There are some individual buildings of importance. The Armories Building is receiving improvement to the extent of $267,000; the Custom House has had $40,000 spent on it; the city has two new Fire Halls, for $43,860; the new Process Building at the Exhibition Grounds cost $81,000; the Art Gallery, $32,350; there is a new Telephone Exchange costing $32,000; a Garage worth $25,000; the Alexandra Theatre permit is for $150,000; McMaster College is spending $60,000 on its new Science Building, and the new wing of Havergal Ladies' College cost $40,000. It is rather remarkable, in view of the overcrowding in the Public Schools, of which we have heard so much, that there is no school building except a Separate School and Convent which [illegible] cost $12,000.

To return to the classified list, the total cost of new dwelling houses of all classes adds up to $7,871,650, or more than seven-twelfths of the whole building bill. This must be [illegible] proportion of dwelling houses to the whole amount of building. We may perhaps take the relation of house value to total value in Hamilton, which is less than one-half, to be more near the normal. Toronto has had some leeway to make up, but with all this house building, and a total value of $5,939,089 in houses interposed last year between us and the winter of 1905, when there was such a dearth of houses, one would think the deficiency must be about made good.

The evidence of the figures is that there are a great number of comparatively cheap houses. There are a few expensive houses being built which will help to raise the average, but even so, on the face of the figures, the average cost of brick houses is only $3,000. The average of other kinds of dwellings, which are more nearly of one kind in each class, will more accurately represent the usual cost of one. The averages are as follows: Roughcast, $950; brick front, $1,656; brick veneer, $1,764; frame, $1,134.

It is the small house of four or five rooms that constitutes the house problem in Toronto just now. This is not a popular class of building for loans, and, for this reason the speculative builder prefers the class above. There are builders ready to do the class of work if the difficulty in the way of loans were smoothed, and that is apparently the direction which benevolent effort should take. There is thought to be danger in the intervention of the municipality as a house builder, and private enterprise in this direction has met with checks; but for the unobtrusive backing of commercial builders by loans at an ordinary rate the field is apparently open, without outrage to political economy, for those who choose to enter it.

New stable accommodation has increased from $140,655 in 1905 to $154,302, an increase of about one-tenth, while garage accommodation has increased from $1,000 in 1905 to $25,000, or twenty-five times, so that any one who wants to juggle with figures in the interest of automobiles can point out, if he wishes, that the increased use of the automobile, as compared with that of the horse, is as 250 to 1. However, the diffusion of stable value in 43 new buildings looks more like normal increase in the use of horses than does the erection of the single garage, in which is concentrated the year's expenditure in this line. There is probably in the garage building as much preparation for the future as provision for the present. A developing industry must look ahead.

This is evidently what the banks are doing. Twenty-two new banks in two years (there were ten in 1905) is a striking growth; hardly necessary, one would think, to meet the actual expansion of trade in the present time, but no doubt well calculated for the future. The actual cost of the buildings is not great, considering their general excellence and the appearance they present. The secret of their distinction lies partly in the preference for corner sites, but mainly in their unity of purpose. It is sometimes necessary, for the sake of external proportion, to harbour a dentist in the upper part of a two-storey order, but there is usually no further complication; the building is essentially devoted to the bank's own purposes. The distinction thus obtained, by the sacrifice of investment in upper storeys, is probably well obtained: for building investment does not outrank other affairs in which banks have opportunity of favorable investment. We may hope this is the case and will continue to be so, for these small banks, each a simple architectural composition, are a great addition to the beauty of the city.

There is another class of small buildings in which the figures tell an obvious story. Of the 10 permits for [illegible] two for $26,500. If we deduct the sum of these, $156,500, from the total value of permits [illegible] $29,000 for nine hotels, is evidently not intended to produce more accommodation [illegible] license.

Toronto is interesting from its size. Its affairs must to a great extent represent the affairs of the Province of Ontario. We should not be surprised or think it argued ill for the general prosperity if the rate of progress was greater in Toronto than elsewhere. It is therefore the more satisfactory to find that in Hamilton the rate of increase is more than double that of Toronto. The additional value of permits for this year is greater than one-half the value for the previous year, while in Toronto, for the eleven months, it is not quite a quarter.

Last year the building values in Hamilton amounted to $1,311,382; this year they amount to $2,124,815. There is, however, a substantial addition of unusual character in a new Armories building, which is costing $225,000. The Hamilton building year ends on Oct. 31st, and we are able to get a complete report. The figures are worth printing:

DESCRIPTION OF PERMITS.

	No.	Value.
Brick dwellings	425	$862,230
Alterations to dwellings	54	22,535
Factories and additions to same	38	284,075
Stores and office buildings	33	442,600
Frame dwellings	110	100,200
Opera houses and halls	3	50,000
Church schools	7	89,200
Concrete buildings	11	14,100
Hotels	4	20,000
Armories	1	225,000
Stables	11	14,875
	697	$2,124,815

The Ottawa total is $1,636,225; the London total about $1,000,000. The Province seems prosperous as a whole.

Of course Winnipeg's expansion is extraordinary. The actual figures, $10,840,000 for 1905, and $12,500,000 for 1906, are nearly equal to Toronto. The rate of increase is, however, not so great.

The distinguishing peculiarity of Winnipeg building is the financial institutons whch throng there, as the centre from which the money is procured for handling the wheat crop of the west, and for the other operations of an expanding part of the country.

It is evident also that manufacturing is progressing there. Thirty new factories, with values quoted at from $20,000 to $100,000, erected in the present year, seem to cast some doubt upon the doctrine that all the money made in the west is bound to be spent in the east.

MONTREAL NOTES.

The year just closing has been a busy one in the building trades. Yet if the volume of work done is greater than in any previous year, the advance is probably not more than represents the steady and natural growth of the wealth of the city. With so much going on to pave the way to the easier transaction of business by land and sea, there seems every reasonable probability that the past does not give any measure of the future progress.

Of actual buildings completed during the past year, some of the more important are: The Mount Royal Club, the McGill Students' Union, New Sherbrooke Apartments, Hampton Court Apartments, Durocher Street Apartments, Jenkins' Building, Lindsay Building, Molsons Bank, St. Catherine St., Bank of Quebec, Montreal Technical and Commercial High School, Alexandra Hospital, besides a very great number of factories and of the smaller class of dwellings—this last to an extent sufficient to affect rents in some degree. New residences of an expensive class are conspicuous by their almost entire absence, one or two in the western part of Dorchester Street being possible exceptions. [illegible] favour for Westmount and the vicinity; the "Annex" [illegible] second. The factories have settled most thickly in the west, from Guy Street outwards, [illegible] borhood of Lachine as to make that settlement into a manufacturing town.

Of buildings in progress the list is large and of an expensive class on the whole. There is the Windsor Hotel Annex, the Light, Heat & Power Co.'s Building, Mark Fisher & Co.'s Building, Royal Bank Head Office, the McIntyre Building, the Linton Apartments, all endeavoring to clothe their steel skeletons with sightlier substance. Other works going on are the Canadian Express Co.'s Buildings, the Notre Dame Hospital, the mother house of the Congregation de Notre Dame, Birks' Building, the Dominion Guarantee Co., St. Catherine Street Postoffice, Bennett's Theatre, La Patrie Offices, Church of the Messiah, Emanuel Congregational Church, Cavendish Apartments, the Vian Biscuit Factory in the east, and the American Tobacco Factory in the west, besides many others.

The prospects for the future are depending, as suggested above, a good deal on the question of transportation. There is understood to have been a good deal of thinking done on the subject of a new railroad terminal for the Delaware & Hudson and New York Central lines. The scheme is probably approaching definite crystallization, though the accomplishment will probably occupy years. A new bridge across the river is implied, and also a large hotel, the location for which, at present under consideration, is the east side of Dominion Square, including the block on which now stand the Y. M. C. A. Building and the Knox Church. The general aim of this terminal is of course to establish more efficient communication with New York. This and the other improvements, in course of construction by the Harbor Commissioners, may be expected to give a great impetus to the trade of the city.

For some years little or no extension has been made to the facilities for getting about from one part of the Island of Montreal to another. Some villages can only be reached by a four-mile drive or walk from the nearest railroad. The Street Railway Company, however, propose during the next year to run a line to the ferry opposite St. Vincent de Paul, making that town accessible by a journey of ten miles instead of seventeen, as at present. The Lachine route is to be extended to Dorval. Bordeaux and Bout de l'isle are to be brought nearer, and a new line from St. Laurent to St. Geneviève should afford a pleasant journey to that pleasant village.

Of buildings in prospect for next year may be mentioned the Eastern Township's Bank at the corner of St. James Street and Victoria Square, which is at present a hole in the ground. The Royal Bank has also purchased a site [illegible] the south-east corner of St. C[illegible] with a view to building. Just opposite, a new ten-storey block for Messrs. Willis & Co. is projected, to cost about $100,000; a considerable part of the building to be let as offices. Messrs. Ross & Macfarlane are designing a new building for the Montreal Sailors' Institute, as an extension to the present premises. A new concert and music hall is to be built in Berthelet Street, to Mr. R. M. Rodden's designs. The main hall, with its gallery, is to seat 1,200 people. On the ground floor there are to be meeting halls, supper rooms, dressing rooms, etc. The cost is to be in the neighborhood of $50,000. The Hervey Institute, at present in Mountain Street, is to be given up and a new building erected at the corner of Claremont Avenue and Windsor Avenue, Westmount. Another Westmount building will be the new school for the Protestant School Commissioners. This is to be on the road on the hill side, between the tops of Lansdowne and Grosvenor Avenues. An [illegible] provide accommodation for automobile and sportsmen's shows. The present Victoria Skating Rink is to be converted into the New Victoria Music and Concert [illegible] to seat from 1,500 to 2,000 persons, with a stage for 300, with the intention of giving grand opera exhibitions and others. Last may be mentioned the new Jail on the Back River.

The City Improvements Committee of the P. Q. A. A. has not made any of its proceedings public for some time. One would like to see public interest in this matter sustained and kept supplied with food for reflection. The scheme at one time announced by the Credit Foncier of erecting a ten-storey building at the corner of St. James Street and St. Lambert Hill has not yet broken ground. A fine boulevard is projected as a continuation of Sherbrooke Street westwards from Claremont Avenue to beyond Notre Dame de Grace. The idea is to make this 100 feet wide, with separate alley in the centre bordered with trees, the car lines alone being carried between the double line of trees.

A distinct increase has taken place in the employment of reinforced concrete, the largest work in this kind being the American Tobacco Co.'s new factory in St. Antheny Street. The additions now building to the C. P. R. Co.'s station in Osborne Street are another example, and, in Lincoln Avenue, near St. Matthew Street, a row of private houses has been erected with walls, floor and roof entirely of concrete. It is not in any case claimed that the first cost of

this material is under that of more usual materials. An experiment in terra cotta is being tried at the new Linton Apartments, the lower storeys of which are faced with large blocks of yellow material, the surface of which is speckled gray, perhaps with the idea of making it a little like stone. Many of these blocks have cracked and require replacing, a circumstance which is not reassuring, but perhaps it is too early to judge of the case. The entrance hall of the McGill Students' Union Building is lined with pale buff terra cotta made in England. The colour is agreeable and the modelling of mouldings and ornament is well done. Artificial stones have been used occasionally, as at the New Sherbrooke, and in a number of small houses, but they cannot be said to have established themselves in common use. For wall-linings of moderate cost chestnut wood is having some vogue.

The year has been happily free from serious labour troubles. Wages have, on the whole, made little change, with the exception of labourers' wages, which have advanced. The present wage rate is as follows:

Ordinary labourers	20c
Builders' labourers	20-22½c
Roof labourers	22½c
Masons	35c
Stonecutters	36-40c
Bricklayers—union wage 45c, actual rate	50c
Roof metal workers	30c
Plumbers	35c
Carpenters—25 to 30c, but generally	27½c
Plasterers	33½-40c
Painters	25-27½c

Labourers working for the city are paid $1.75 per day; carters with single team, $2.50, with double team, $4.00.

At the banquet of the Builders' Exchange the Hon. W. A. Weir spoke on the need of better facilities for technical education in Montreal. Anything that may be done to this end must be very welcome to all interested in good handiwork. It is to be hoped the matter will not be allowed to drop, but will be discussed thoroughly and by all concerned [illegible] put on a broad basis. The ordinary routine of technical education will probably never be adequately taught in a school. Nothing can replace a thorough apprenticeship to a trade for teaching that trade thoroughly to the body of its workers. But no high standard of general excellence can be attained unless the more capable minds amongst the [illegible] the opportunities for studying and [illegible] everyday experience. This it is that can be provided in a technical school. There [illegible] those of keener and broader mind than their fellows can resort to [illegible] there is to aim at and if possible surpass.

SKETCHING CLUB, P. Q. A. A.

The members of the club met at the Beaver Hall Square rooms, on the evening of the 21st November, to listen to Mr. Philip Lahee on the Business of Electric Installation. The lecturer had, however, been suddenly called out of town, and in his absence the lantern was brought into play and a series of slides showing Greek sculpture, lent by McGill University, was exhibited and discussed by the meeting.

The annual dinner of the club was held in the "Oxford" on the evening of the 28th November. The guests were: Mr. Chaussé, President of the Province of Quebec Association of Architects; Prof. Nobbs, and Mr. William Maxwell. Mr. Chaussé conveyed to the club the good wishes and assurance of the keen interest of the Provincial Association. Prof. Nobbs, responding to the toast of "the guests," said he had just returned from a short visit to New York, where he had made a special point of enquiring into the aims and methods of the American Society of Beaux Arts Architects, with a view to ascertaining whether it would be advisable that the Sketching Club should seek affiliation and co-operation with that body. He had been deeply impressed with the clearness of purpose and thoroughness of method of the Beaux Arts Society. It had accomplished a great work and bade fair to become the great training field of American architects. One point, however, he felt bound to criticize, and that was the limited view it took of architecture, a fault it had in common with the Ecole des Beaux Arts of Paris. In this view the whole labor and accomplishment, the whole glory and delight, of our mediaeval predecessors is a past phase of life which has taught us nothing. To shut our eyes to an art which transformed its buildings into organisms full of all the charms of craftsmanship, and throbbing with human interest, for the sake of a studied formalism, however dignified and refined, was in Prof. Nobbs' opinion a mistake so radical that he thought the Sketch Club should rather keep to its own pleasant bypath than share such an arid highway. Whilst the nations of Europe are each awakening to new life in architecture, along lines characteristic of each, and each with a distinct note of individuality, there is a tendency in the United States to harden up into rigid forms and academic rules. It would be better, Prof. Nobbs thought, to take inspiration from our own national traditions, give our individuality a chance to express itself. He was preparing to read before the Ontario Society of Architects a paper which was to deal with this subject of our national traditions, and hoped he would have an opportunity of saying something further on the subject to the Sketching Club also.

A very enjoyable evening brought out much musical talent in the club.

On the 5th of December members met at the club rooms and worked on the second of the series of design subjects for the season. Seven sets of designs were sent in in competition for the first of the series. The new subjects were, in Class A, a shelter to the access stairs of a city subway; and in Class B, a simple mediæval tower [illegible]

STUDENTS' COMPETITION.

It is with pleasure that we are permitted to announce that Mr. M. Tsuboi, a Japenese student in the office of Messrs. Gordon & Helliwell, architects, Toronto, has been awarded the

MR. M. TSUBOI.

first prize of $100 in the competition among the students of the International Correspondence School for a $3,000 country house. The prizes were donated by Mr. Comstock, of the Architects' and Builders' Magazine. There were over 100 competitors, and five countries were represented, namely, Canada, United States, Cuba, South Africa and New Zealand. The second prize was won by Miss Helen B. McConnell, of Clarksburg, W. Va., and the third prizes by Mr. Karl R. Kipp, of Dannemoria, N. Y., and Mr. E. Parmenter, Toronto.

MCGILL STUDENTS' UNION, MONTREAL.

OUR ILLUSTRATIONS.

THE MCGILL STUDENTS' UNION, MONTREAL.—PERCY E. [illegible] & WOODS, [illegible]

The association of the architects of this building [illegible] signed [illegible] Nobbs. Professor Nobbs subsequently drew the [illegible]

READING ROOM EXTENDING ACROSS THE FRONT.

decoration was made from his models. A building of definite character is to be expected from so much personal care ou the part of the designer, and certainly the building is in character with its purpose. It looks like a club, a men's club and, one may almost say, a young men's club. It is distinctly of this generation, but, fortunately, without relation to any American fashion. We have here the English tradition, a free classic which [illegible] ages. The long reading room, which extends across the whole front on the principal floor, has mullioned [illegible] the internal effect shown in our illustration [illegible]

The hall and vestibule are lined with a pale, buff terra-cotta made in England by the Burmantofts Co.

RESIDENCE FOR DUNCAN MACDONALD, ESQ., TORONTO.—MESSRS. BOND & SMITH, ARCHITECTS, TORONTO.

A well planned house of this kind cannot depart far from a recognized type without going wrong. The variations occur in putting together the typical arrangement. Here the possibility of internal variation in similar plans seems to be inexhaustible. In the present plan the ground floor hall, on the lines of many thousand others, is a novelty, and suggestive of further development. People want now-a-days to use their hall as a sitting room or place to receive visitors. The stair is incompatible with comfort in this respect. It is therefore, here shut off by a screen and door, as shown in one of our illustrations. This, with the expansion of the fireplace, transforms the hall into a usable room. The fireplace bay, with the light coming from it sideways to the hall, is an essential part of she scheme, breaking up the tunnel effect.

The separation of the staircase by doors has already been practised as a means of making one stair serve for all purposes. This really seems, in view of the plan before us, to be the proper thing to do in small houses. The idea works both ways, reducing the tairs and adding to the living space.

Compensation to Workmen
Alien Contractors
Technical Education

During the past month matters of considerable moment to Montreal contractors have come under the review of the Montreal Builders Exchange, upon which action has been taken by the Board of Directors, and as some of these matters possess more than local interest, it may not be amiss to give them more extended prominence through the medium of the CANADIAN ARCHITECT AND BUILDER.

A subject of transcendant importance to all employers of labor, whether in the building or manufacturing, is the proposed act which will be reintroduced by the Attorney General, in the forthcoming session of the Quebec Legislature, respecting compensation for damages resulting from accidents to workmen. This bill proposes to change the principal of compensation from the English Common Law, which presumes every one, innocent until proved guilty," to that of the French Law, which will assume the employer guilty until he can prove himself innocent, it will regard each employer's trade as containing an inherent risk intstead of as hitherto requiring the injured workmanto prove "contributory negligence" on part of the employer.

This effect of this proposed volte-face cannot be too highly estimated by every employer; and all who have [illegible] in any shape, should carefully examine this proposed legislation without delay and and take steps for their protection before it is too late. Copies of the act in French and English can be had on application to the office of the pubishers of "Le Soleil," Quebec.

The second matter of interest that called for co[illegible] of "alien" contractors in Montreal, from the view-point of [illegible] local concerns. Some interesting correspondence took [illegible] City Council of Montreal, copies of which were also forwarded to the Provincial-Treasurer, in Quebec, and the Council of Architects in this city. Following is an extract regarding the matter from a civic standpoint.

30th October, 1906.

His Worship H. A. Ekers, Mayor of Montreal:

Worshipful and Dear Sir,—At the request of my Directors I beg to submit the following important matter connected with the large building interests represented by this Exchange to your early consideration.

We have been confronted for some years past with the spectacle of seeing foreign contractors coming into this city and taking contracts out of the hands of our local contractors and architects. Some five or six years ago, when the London & Lancashire Building and the McGill Medical Building were being erected (E. W. Bishop Co.) and the Bank of Montreal reconstructed (Norcross Brothers, both American concerns), the stand was taken, as you will see by the enclosed news cuttings at that date, that "patriotism" should be appealed to and such outside firms excluded. To-day we take a broader view, and ask the city authorities only that such non-resident concerns should merely be put upon the same basis as permanent local firms.

The point we take issue on is this: Our local contractors are subjected to full local taxation, both for property and business taxes. These outside firms, on the other hand, are exempt from such taxes; they have, as a rule, no yards or premises; their business, which runs from tens to hundreds of thousands of dollars, is transacted either in the private boarding-house or hotel of a resident agent, who thus contributes to the city exchequer neither real estate or business tax, as the latter is collectable on the assessed rental of the premises, which in their case are non-existent. Above all, these outside contractors are exempt from the ten years' guarantee demanded in the case of local concerns, because as soon as the particular job is completed they flee to "pastures new" and any guarantee on their part vanishes into air. These important exemptions constitute a decided discrimination against the local concern, and by means of these very lessened charges procure the contract to the latter. In addition, both the above firms failed over the prices they took the contracts at, and thus let in their local sub-contractors to settle with the proprietors the best way they could.

There are large contracts going on to-day on the same lines (of which I give you enclosed one example, and can give you a number of others in confidence). My Board asks you, as President of the City Council, to make our suggestions in the proper quarters (City Treasurer and Finance Committee) to equalize the present inequalities by imposing a special tax of say one-half of one per cent. (not on rental value of premises, neither [illegible] which are adequate in such cases, but) on the actual price of the work contracted, which would be a fair assessment. No work can be commenced without a building permit, which should give the actual and not a fictitious value; or better still, the real price could be obtained by a sworn statement from the architect in charge of the work.

We have to-day the largest structures going up by foreign "Construction Co. [illegible] possessing anything of more value in this city than [illegible] smaller office room, useless for assessment purposes. The city needs revenue, and we consider that right here is [illegible] revenue.

[illegible] Honorable Council will take this matter into prompt consideration, I remain,

Yours respectfully,

J. H. LAUER,
Secretary-Treasurer.

The subject was also brought to the attention of the Province of Quebec Association of Architects, who in reply stated that the Council of the Association was of the opinion that the members of the Association are specially protected by charter, and regretted that the Association could not intervene in the matter.

The question of Trades Schools has become a "live" subject in local, civic and Provincial circles of late, and much prominence given to it in the press. In this matter we are far behind Toronto, not to mention the large cities of the State. As it is a question of supreme importance to employers in the Building Trades in view of the complete decadence of the former apprenticeship system, the Executive of the Builders Exchange recently addressed the following

communication to the Hon. W. A. Weir, Minister of Public Works, of the Province of Quebec.

At the last meeting of the executive board of this Exchange I was requested by the Directors to convey to you their sincere appreciation of you efforts on behalf of the establishment of technical and trade schools on a practical basis in this city.

At the same time the Directors also expressed the earnest desire that when the proper time arrives for entering upon the detail of the proposed scheme, you will also call into your council a committee of Master Builders representing this Exchange, both as to suggestions for courses of instruction in practical trades, and as to a system of examination after adequate training by an examining committee of master mechanics in their respective trades.

It would be an impertinence on my part to remind one so well versed and so deeply interested in the cause of education in this province as you are known to be, of what vital importance to the Master Builders of this or any city is the establishment of trade schools on practical lines. The Building Trades cover the employment of almost every class of skilled mechanics outside of the textile industries, and owing to the mistaken action of the unions in arbitrarily limiting the number of apprentices, we are threatened with the danger of a dearth in the mechanical skill in the ranks of workmen. The old system of apprenticeship has passed away; it ceased to exist when the Master Mechanic no longer worked with his men, and when modern methods of conducting business required that labor should be subdivided. Then not only was the apprentice deprived of the personal care of his master, but the workshop ceased to be a [illegible] trade could thoroughly be acquired. Our lads, barred from acquiring a good mechanical trade where they are much needed, are driven to swell the already overcrowded ranks of clerks; and today there is scarcely a skilled mechanic in this city who has learned his trade in Montreal.

We have already a [illegible] e. g. the technical high school, Sherbrooke Street, Laval Ecole Polytechnic [illegible] the Council of Arts and Manufactures [illegible] something wider and more complete, not limited merely to the working man, but open also to well educated men. Master mechanics send their sons to the New York trade schools, from all parts of the United States and even from Canada. We have our "Schools of Theory" richly endowed; may we not look for equally generously supported "Schools of Practice"?

A few words as to the financial side may not be deemed out of place, as trade schools are no longer merely experimental. It may not be advisable for more than a few trades to be taught at first. Bricklaying, plastering, carpentry, plumbing, produce the speediest results. The initial cost is the building. After shelter has been provided two or three thousand dollars will equip the school and meet the first demands. I am quoting from the New York trade schools which, started in the early '80s and meeting with growing success, have since become State institutions. Besides the evening classes which are largely composed of helpers who come to the school of their own accord and at their own expense, to gain the knowledge they know cannot be had in the work shop, there is also a day class. The course covers from 5 p.m. to 7-9.30 evenings, day classes concurrently covering similar ground for those who do not care for night work. The instruction is intended for lads not under 17 nor over 21 (unless exceptional case) as the scheme would otherwise become extremely unpopular with the regular journeymen. It would be a mistake to give instruction free of charge (unless by exception), as what costs nothing is never valued. It cannot be too strongly emphasized that the young men do not want charity but will pay gladly any reasonable charge to cover the expenses and will save for that purpose when once it is known that the trade school is the entrance gate to the building trades. The fee should meet the running expenses. At the New York Trade School the evening bricklaying class pays expenses with 75 members at $20 each; day plumbing class (with waste of material) 50 members at $35 each; and evening class 100 members at $12 each; evening stonecutter's class, with 25 members at $12 each; carpentering and plastering with 40 at $16 each.

A moderate increase of these fees would also meet the expense for janitor, clerk, fire, light, etc., and make the school self-supporting.

I trust I may not have trespassed too much upon your valuable time, but it is the desire of the Exchange to see these proposed Trade Schools eminently practical and widely availed of, and to this end I trust you will not hesitate to call upon us when our Association can be of further use to you.

ANNUAL DINNER OF THE MONTREAL BUILDERS' EXCHANGE.

TECHNICAL EDUCATION AND OTHER IMPORTANT MATTERS DISCUSSED.

Seldom has the splendid banquet hall of the [illegible] hostelry, the Windsor Hotel, held a more representative and genial gathering than this assembly, on the evening of December 3rd, of the leaders of the allied building trades, Montreal, on the occasion of the Annual Dinner of the Montreal Builders' Exchange. The President and Toastmaster, R. George Hood, was supported by Vice-President, Jos. O. Deslauriers, [illegible] the following: Vice-Chairmen, Jas. Simpson, [illegible] Hutchison, [illegible], Past President; John Gray, W. E. Ramsay, N. T. Gagnon, Chr. Sonne, Reception [illegible] [illegible] supply and construction [illegible] architectural [illegible] various branches of building. All arrangements for the dinner were made by a dinner committee, of which Mr. Jas. Simpson was chairman, with the able assistance of the general secretary, Mr. J. Herbert Lauer.

The menu, which is given in full, was in the form of a legal agreement and reflects great credit upon its originators, Messrs. Lauer and W. R. J. Hughes.

APPETITE & DIGESTION
ARCHITECTS
Montreal, Que.

THIS AGREEMENT, made the Sixth day of December in the year one thousand nine hundred and six by and between the Builder's Exchange, of Montreal, as represented by the President, Past Presidents, Directors and Officers, party of the first part (herein designated the Owners), and Honorable Representatives of the Federal and Provincial Governments, of the Municipal Authorities, Sister Associations, the General Body of Members and other guests party, of the second part (hereinafter designated the Contractors),

WITNESSETH that the Contractors in consideration of the fulfillment of the agreements herein made by the Owners agree with the said Owners as follows;

Article 1. The Contractors under the direction and to the satisfaction of Appetite & Digestion, Architects, shall and will perform all the work mentioned in the Menu and Programme (which Menu and Programme are identified in the presence of the parties hereto and are hereby made a part of this contract) for the:—

Demolition and subsequent removal of the materials provided

in accordance with the menu furnished by the Place Viger Hotel, such material being now exhibited on the tables of said Hotel, and on condition that all said materials be employed in the rebuilding of the Inner Man, and in the following order :—
1. Foundation, Malpecque Oysters, well bedded on an undisturbed stomach; 2. Grouting, to be well flushed up with consommé Printannier Royal; 3. Structural Ironwork, fish plates to be furnished à la menu, Boiled Gaspé Salmon, well bolted with Cucumbers and Pommes Marquise; 4. Entrées, at any time while work is going on, Sweetbreads à la Montglas; 5. Brickwork, Roast Stuffed Turkey, joints to be well-bonded with Cranberry Sauce, and vegetables to taste; 6. Roman Punch, in charge of a competent foreman speaking Italian; 7. Partitions, to be well-studded and braced with Roast Bluebill Duck (no high stakes allowed at this "game"), and to be pugged with Red Currant Jelly and Watercress; 8. Roofing to be covered with four-ply Gateau Assortis, well-fleshed with Champagne Jelly; 9. Decoration, all paints to be mixed with café noir, and finished in tints to match Fruit in season; Oak to be well fumigated with approved brand of Cigars; 10. Toasts and Tunes, or if not in tune, the air to be had gratis outside.

Art. II. The Architects shall furnish to the Contractors such power and ability as without explanations may be necessary to demolish and dispose of the above Menu, and the Contractors may dispose of the same as part of this contract so far as may be consistent with their health and physical wellbeing.

It is mutually understood and agreed that all after effects and consequences are and remain the property of whom it may concern.

Art. III. No alterations shall be made in the work shown or described by the Menu and Programme except upon a protest of the Architects, and when so made, the value of the damage done shall be computed by the Architects, and the amonnt so ascertained shall not be deducted from the contract price. In the case of dissent from such award by either party hereto, the valuation of the work added or omitted shall be referred to any competent physician or duly qualified Magistrate, and in the event of failure to agree, the parties shall go to gaol or hospital, as the case may be, at their own expense.

Art. IV. The Contractors shall provide sufficient, safe and proper facilities at all times for the disposal of the work by the Architects or their authorized representatives. They shall, within twenty-four hours after receiving internal notice from the Architects to that effect, proceed to remove all materials condemned by them, whether worked or unworked, and to take down such remedies as the said Architects (Messrs. Appetite & Digestion) may deem necessary to the due fulfillment of this contract.

Art. V. Should the Contractor at any time refuse or neglect to supply a sufficiency of proper ability and [illegible] prosecute the work with promptness and diligence, or fail in the performance of any of the agreement herein contained, such refusal, neglect or failure shall be subject to the pains and penalties usually imposed by the Architects, (Appetite & Digestion).

Art. VI. The Contractors shall complete the several portions, and the whole of the work comprehended in this Agreement by and at the time or times hereinafter stated, to wit :— Commencing sharp at 8.15 p.m. with the oysters, etc., as above specified, and from that time until the work of demolition or removal be carried out or until the complete fulfillment of the contract, even if such completion require extension of time until the "wee sma' hours o' the morn'."

Art. VII. Should the Contractors be obstructed or delayed in the prosecution of [illegible] neglect, or delay or default of the Owner, or of any [illegible] any damage which may happen by bones, pepper, tobacco, small talk [illegible] then the time herein fixed for the completion of the work shall be extended for a period equivalent to the time lost by reason of any or all of the causes aforesaid.

Art. VIII. In order to secure completion of this work on the part of the Contractors, at the time and in the manner specified, it is hereby stipulated that the damages arising from non-fulfillment of this contract shall be the Hunger and Thirst of such defaulter.

Art. IX. It is hereby mutually agreed between the parties hereto that the sum to be paid by the Contractors to the Owners for said work and materials shall be the full price of the Ticket, rebates strictly barred subject to additions or Extras, and that such Extras shall be paid in current funds by the Contractors in full on production of wine-cards (Perrier-Jouet, Extra Dry, or a case of Ussher's Scotch, duly signed or attested).

The final payment shall be made before the beginning of the work.

Art. X. It is further mutually agreed between the parties that no kick before, during or after the work, shall be conclusive evidence of the good faith or sanity of the kicker.

Art. XI. Said Contractors further agree to protect and indemnify said Owners against accidents which may occur as an "aftermath" from Stairs, Sidewalks, Automobiles, Street Cars, Cabs, Police, Mrs. Grundy, Mrs. Caudle or La Bonne Femme.

Art. XII. The said parties for themselves, their heirs, executors, administrators and assigns, do hereby agree to the full performance of the covenants herein contained, and to comply in all respects with the law in relation to proper gentlemanly conduct, and dinner etiquette.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands and seals, the day and year first above written.

Witness to Signature of Owners, { R. George Hood, (President) / J. Herbert Lauer, (Secretary)

Witness to Signature of Contractor,

About two hundred and fifty guests sat down to dinner. At the table of honor were: President and toastmaster, R. George Hood; past president, Mr. N. T. Gagnon; Hon. W. A. Weir, Minister of Public Works; C. H. Catelli, president Chambre de Commerce; Alcide Chaussé, president Architects' Association Province of Quebec; Jos. Haynes, professor of architecture, Laval; Geo. Wood, of Messrs. Hutchison & Wood; Adolphe Brassard, architect, Provincial Public Works; Jos. Perrault, architect; P. C. Ogilvie, president Master Plumbers' Association; W.T. Castle, vice-president Master Painters' Association; W. B. Shaw, representing Electrical Contractors' Association, and among the other guests present were Messrs. H. Desjardins, T. Mitchey, W. McArthur, W. Livermore, John Smith, W. King, A. Bremner, G. A. Robinson, W. J. Little, J. Gray, J. W. Ross, jr., P. Murphy, Vivian H. Graham, Stanislaus Rochon, jr., Eugene Guilbault, H.A. Whitley, Jas. Morin, J.H.Hutchinson, J. W. Hughes, J. G. Peicher, C. G. Lanctot, W. C. Thomson, J. E. Goodman, James Young, Alex. Smith, R. C. Benning, John Quinlan W. J. Arthur, A. M. Arthur, Wm Morrison, J. E. Jones, N. B. Giles, A. Truaisch, J. L. William, E. Cavanagh, James Morrison, G. Vogelsberger, S. W. Williams, J. Morrison, H. P. Bowden, W. A. Toohey, H. E. Stenson, T. W. Foster, A. Binda, J. Simard, J.A. Simoneou, J. Murphy, Jos. Thibeault, J. Brunet, R. I. Clark, R, Clark, F. W. Beanfield, T. T. Powell, A. F. Crosman, W. E. Potter, W. S. Hunter, Bruce Turner, J. M. McAnally, D.P. Rees, F.E. Maxell, J.J. Petit Clair, L.S.Rochon, F. J. Charbonneau, E. W. Sayer, E.M. Mitchell, J.B. [illegible], C. Dallaire, C. P. Godin, E. T. Hought[illegible], A. Wright, J. B. [illegible]ford, J. Simpson, Jos Wigmore, John McLean, J. Stewart, G. L. Craig, H. A. Finkle, J. B. Sparrow, W. H. D. Murray, Craig Campbell, J. Duthie, Chevalier C. Mariotte, H. R. Hutchinson, H. L. Paton, W. P. Baxter, W. R. J. Hughes, G. A. Robertson, Chas. Donohue, E Richardson, P. Smith, J. C. Watson, C. S. J. Thomson, F.W. Cooper, G.H. Langudge, E. T. Ramsay, L. Lefebvre, Martin C. Waller, Chas. Weldron and H. R. Hussey.

Before ten o'clock the tables were cleared [illegible], President of the Exchange, introduced the toast list. [illegible] had been arranged to have many of Canada's leading men present at the banquet [illegible] public duties, many of them were compelled to decline the invitation.

Amongst others were letters of regret from The Right Hon. Sir Wilfred Laurier; Hon. Rudolph Lemieux, Post Master General; Mr. Robert B. Ames, M. P.; Mr. F. D. Monk, M.P. and Mr. Matheson, President of Board of Trade.

Hon Lomer Gouin, Premier of Quebec, had accepted an invitation to be present, but, owing to a hurried call, was compelled to leave for Quebec. His colleague, Hon. W. A. Weir, Minister of Public Works and Labor was present and responded to the toast of our Legislature, Province of Quebec. Mr. Weir, after congratulating his hosts on their hospitable gathering, spoke chiefly along the lines of technical education. He first emphasized the absolute necessity for a higher standard of elementary education, and made the surprising statement that many pupils left the elementary schools of the province, and in a few years forgot how to read. This, he said, is nothing short of a national calamity. Canada would never be a really great nation, unless each man, woman and child could read and think intelligently of what they read. The decadence of the apprentice system showed the need of

technical schools, and Mr. Weir cited the fact that one United States correspondence school had twenty thousand Canadians on its books. It was a national shame and disgrace that there was not sufficient public spirit among the wealthier class of the country to provide, within the borders of the Dominion, sufficient technical education for the young people.

In 1898 there were atttending the classes of the Council of Arts and Manufactures, in Montreal, Quebec and Sorel, 821 pupils. Last year, the numbers had grown to 2,221 or 300 per cent. increase. Parents were continually feeling the lack of opportunities for the technical education of their children. Universities like Laval and McGill might well follow the example set by the little University of Dalhousie, in Nova Scotia, which, feeling the urgent need of technical education, had established schools in five different towns of that province, a great deal of the instruction being given free by the professors and alumni of Dalhousie.

He had recently visited the classes of the Council of Arts and Manufactures at the Monument National, and had been grieved to see the number of young men and women amidst such surroundings and in an impure atmosphere seeking to obtain knowledge. Such a condition of affairs was a disgrace to the citizens of Montreal. Why was not the example set

Mr. R. George Hood, President.

by such cities as New York, Philadelphia and Spring[illegible] these cities institutions for technical training of the young men had been built out of the pockets of the people. It was the exception in the United States for any such institutions to be subsidized by the state. Toronto also had a technical institution, built by the puplic-spirited citizens, with the aid of the corporation. Why should Montreal be behind hand in this direction? The members of the Manufacturers' Association, out of their wealth, should take a practical interest in this question. A high tribute was paid to the munificence of Sir William Macdonald in the establishing of such institutions as the one at St. Anne's.

The little country of Saxony, with a population of four millions, head 231 technical schools, with an attendance of 29,000 pupils, There were barely a dozen such schools throughout the length and breadth of Canada. Was Canada to be subordinate to the trained artisans of Europe?

"Don't forever be looking to the Government," was Mr. Weir's final advice. "Do something for yourselves. Poor as we are—for reason that you will not give us enough taxes—we will help liberally any steps taken towards the establishment of technical schools throughout this province of ours."

Mr. Hood, the chairman, in the course of his remarks, stated that the labor unions were doing good work, but he thought it was a mistake for them to limit the number of apprentices and make it difficult to acquire a knowledge of the various trades.

The chairman's speech was along similar lines, but broadening out to include other questions of interest to the building trades, such as accidents to workmen, builders' liabilties in construction, etc. He also advocates the formation of an employment register, and more comodious premises for the fast-growing Exchange.

Then followed a bright, interesting programme of

Mr. N. T. Gagnon, Past President.

speeches, music etc., that lasted, with merriment and cheer, away on into the 'wee sma' hours.'

Only after repeated and urgent [illegible] was Mr. Lauer, the secretary, and incidentally, the musical [illegible] of the evening, induced to speak to the guests. His reception was evidence of the recognition of the worth of his services.

Mr Lauer commented on the fact that hostile criticism had been directed at the Exchange, because of these social gatherings, but he pointed out, that, as

Mr. J. H. Lauer, Secretary.

a result of these affairs, business men met their competitors on a friendly footing, and learned to respect one another. These gatherings, as well as the casual meetings at their Exchange Rooms, give opportunities for a greater volume of and improvement in business.

It may interest our readers to learn that wheras in May, 1905, the Exchange numbered only 59 members, that it has now over 230 of an increase, due largely to the energetic administration of Mr. Lauer.

Already the Exchange needs larger quarters, and there is even now some talk of erecting a building suitable for their fast growing needs.

THE CANADIAN CLAY PRODUCTS MANUFACTURERS

The fifth annual convention of the Canadian Clay Products Manufacturers was held at the Rossin House, Toronto, Wednesday, Thursday and Friday, December 12th, 13th and 14th. There were about 125 persons registered, as follows;

C. H. Bechtel, Bechtels, Waterloo; S. J. Heafield. American Clay Machinery Co., Bucyrus, Ohio; S. J. Fox, Lindsay, Ont.; J. B. Russell, Toronto; D. O. Lochrie, Toronto; C. E. Whyard, Bechtels, Waterloo; Robt. Holtons, Drew, Ont.; Alex. Smith, A. Smith & Son, Cowal, Ont.; Milton Smith, A. Smith & Son, Cowal, Ont.; C. E. Norton, W. J. Norton & Son, Alliston, Ont.; O. Baird, H. C. Baird, Son & Co., Parkhill, Ont.; R. J. Davenport, H. C. Baird, Son & Co., Parkhill, Ont.; J. F. Wilson, H. C. Baird, Son & Co., Parkhill, Ont.; A. Snyder, A. Snyder & Co., Portage La Prairie, Man.; C. A. Snyder, A. Snyder & Co., Portage La Prairie, Man.; J. W. Snyder, A. Snyder & Co., Portage La Prairie, Man.; F. J. Hutchins, H. C. Baird, Son & Co., Parkhill, Ont.; T. Henderson, Renfrew, Ont.; G. B. Drennan, J. D. Fate, Co., Plymouth, Ohio; W. H. Wood, Brockville, Ont.; A. Neal, Seeleys Bay, Ont.; J. E. Randall, T. A. Randall & Co., Indianapolis, Ind.; J. Cornhill, J. Cornhill & Sons, Chatham, Ont.; W. H. Elliott, Glenannan, Ont.; W. Elliott, Glenannan, Ont.; T. M. Milligan, Harvard P. O., Ont.; J. Sullivan, Port Credit Brick Co., Toronto; F. R. Miller, Port Credit Brick Co., Toronto; J. Cornell, Thedford, Ont.; W. Freek, Barrie, Ont.; C. Sawden, C. Sawden & Son, Toronto; H. E. Reid, Barrie, Ont.; A. Berg, A. Berg & Sons, Toronto; J. Berg, A. Berg & Sons, Toronto; S. Berg, A. Berg & Sons, Toronto; J. S. McCannell, Milton Pressed Brick Co., Milton, Ont.; G. W. Moody, Highgate, Ont.; A. M. Wickens, Toronto; G. W. Close, Close Brick Co., Stratford, Ont.; H. de Joannis, Chicago, Ill.; C. W. Close, Close Brick Co., Stratford, Ont.; R. F. Ollman, Ollman Bros., Hamilton; A. Dowker, Fort [illegible] Ont.; W. [illegible] Co., Welland, Ont.; E. Hooker, D. D. Hooker & Co., Welland, Ont.; H. Cornhill, J. Cornhill & Son, Chatham, Ont.; F. Cornhill, J. Cornhill & Son, Chatham, Ont.; W. McCredie, Lyons, Ont.; Neil McFee, Park Hill, Ont.; C. A. Gibbs, Bechtels, Waterloo, Ont.; B. E. Bechtel, Bechtels, Waterloo, Ont.; H. A. Cozzens, St. Catharines, Ont.; J. B. Millar, Don Valley Brick Works, Toronto; V. O. Phillips, Twin City Oil Co., Berlin, Ont; John Watson, Watson Brick Co., Bracebridge, Ont.; Geo. Frid, Geo. Frid & Co., Hamilton, Ont.; S. Wright, Kincardine Brick & Tile Works, Kincardine, Ont.; S. Wright, Chesley, Ont.; J. C. Wright, Proton Brick & Tile Works, Proton, Ont.; G. A. Norton, Norton Bros., Carleton West, Ont.; T. W. Norton, Norton Bros., Carleton West, Ont.; Geo. Angus, Toronto; W. B. Bechtel, Bechtels, Waterloo, Ont.; Jas. Irwin, Jas. Irwin & Sons, Norwich, Ont.; E. J. Neal, Seeleys Bay, Ont.; Wm. Adamson, Walkerton, Ont.; N. B. Card, Harrisburg, Ont.; C. Ott, M. Ott & Son, Harrisburg, Ont.; R. H. Hamley, Bowmanville, Ont.; Thomas Kennedy, Dominion Sewer Pipe Co., Swansea, Ont.; F. Schaefer, Breslan, Ont.; Geo. Schaefer, Breslan, Ont.; C. G. Frank, C. G. Frank & Sons, Strathroy, Ont.; G. W. Pakenham, Weston, Ont.; E. J. Brown, Brown Bros. Brick Co., Mount Dennis, Ont.; Jos. Brown, Brown Bros. Brick Co., Mount Dennis, Ont.; David Martin, Thamesville, Ont.; A. W. Wright, Toronto Fire Brick Co., Mimico, Ont.; J. W. Ball, Toronto Fire Brick Co., Mimico, Ont.; Wm. Hancock, Hamilton, Ont.; J. King, Fruitland Brick & Supply Co., Fruitland, Ont.; J. M. Scott, Meaford Brick Works, Meaford, Ont.; I. Price, Toronto; D. O. McKinnon, Canadian Manufacturer, Toronto; J. Mouldey, J. Mouldey & Co., Toronto, Ont.; Geo. Whittington, Nanaimo, [illegible]; W. Meikley, Meikley Bros., Casselman, Ont.; P. S. Keith, Canadian Machinery, Toronto; M. Ryan, M. Ryan & Son, Fredericton, N. B.; J. R. Irwin, Anderson & Irwin, Waterford, Ont.; H. Carnahan, [illegible] & Co., Toronto; Barton Dryer Co., Chicago, Ill.; L. H. Linden, Tilsonburg, Ont.; A. W. E. Hellyer, Coin Brick Co., Ottawa, Ont.; J. A. Lamond, E. Leonard & Sons, London, Ont.; J. M. Govenlock, Winthrop, Ont.; R. G. Way, Trenton, Ont.; A. Deller, Geo. Deller & Sons, Norwich, Ont.; J. R. Milner, J. T. Wing & Co., Windsor, Ont.; W. H. Freeborn, Brantford, Ont.; Geo. Crain, Beamsville, Ont.; Edward Orton, jr., Columbus, Ohio; Wm. Baillie, Laprairie Brick Co., Montreal; Chas. Curtis, Curtis Bros., Peterboro, Ont.; F. R. Ollman, Ollman Bros., Berlin, Ont.; J. F. Ollman, Berlin Brick Co., Hamilton, Ont.; W. J. Packham, Brampton Pressed Brick Co., Brampton, Ont.; H. R. Irwin, Jos. Irwin & Sons, Norwich, Ont.; Henry James, Deleware, Ont.; Wm. Roberts, St. Catharines Brick & Tile Co., St. Catharines, Ont.; W. M. Carter, St. Catharines Brick & Tile Co., St. Catharines; W. E. Spantz, Berlin Brick Co., Berlin, Ont.; Wm. Wright, Kincardine, Ont.; J. F. Hollis, Toronto; J. H. Morrison, Toronto; John McBain, Milton Pressed Brick Co., Toronto; John Maloney, Toronto; James Pears, Davisville P. O., Ont.; Wm. Pears, Ontario Paving Brick Co., Toronto Junction, Ont.; J. H. Lainson, Lainson & Sons, Toronto Junction, Ont.; D. Scott, Jas. Lochrie & Co., Toronto; R. J. Kearney, J. Lochrie & Co., Toronto; Prof. Coleman, School of Practical Science, Toronto; Prof. Baker, Ontario School of Mining, Kingston, Ont.; M. Wilson, Gladstone, Man.; H. Stephens, Portage La Prairie, Man.; E. New, Hamilton, Ont.; John Crawford, Crawford Bros., Hamilton, Ont.; R. H. Rose, Dominion Belting Co., Hamilton, Ont.; Frank Crawford, Crawford Bros., Hamilton, Ont.

MR. S. J. FOX, M.P.P.
Retiring President Canadian Clay Products Manufacturers.

MR. J. B. MILLAR,
President-Elect Canadian Clay Products Manufacturers.

The Convention was called to order on Wednesday afternoon by the President, Mr. S. J. Fox, and was welcomed on behalf of the citizens of Toronto by Alderman J. J. Graham, Chairman of the Reception Commitee of the City Council.

The President made a short address reviewing the work during the past year and also the object of their meetings and requested the members to ask questions on the different subjects and so create discussions. The Secretary-Treasurer's report was then read and adopted.

MR. J. S. MCCANNELL,
First Vice-President Canadian Clay Products Manufacturers.

Professor Coleman, of the School of Practical Science, gave a very interesting lecture on the formation of different clay deposits throughout Canada, and a very hearty vote of thanks was tendered him.

Papers were then read by Mr. A. Berg, of A. Berg & Sons, Toronto, and Mr. J. S. McCanoel, Managing Director of the Milton Pressed Brick Co., Milton, Ont., on "Pressed Brick as a Building Material" and "Mining and Preparation of Material" respectively.

After discussion on various subjects the meeting was adjourned till Thursday afternoon.

Thursday morning the members were the guests of the Don Valley Brick Works, who provided a special train to convey the members to their plant in the picturesque Don Valley, which was then thoroughly inspected.

The main feature of the Thursday afternoon session was a lecture on "Technical Education," by Professor Orton, jr., of the Ohio State University, Columbus. The officers of the Association are to be congratulated on obtaining the services of such an authority; needless to say, the lecture was thoroughly enjoyed. A unanimous vote of thanks was tendered the Professor for his highly interesting discourse. At the present time when the Association are endeavoring to have a class opened in the School of Science for the training of clay workers, Professor Orton's lecture was very appropriate indeed.

A lecture was delivered by Professor Baker, of the Ontario School of Mining, Kingston, on "Grogs in Brick Making" which is published in this issue.

Mr. J. B. Millar, Superintendent of the Don Valley Brick Works, read a paper on "Comparative Economy of Construction and Operation of Down Draft and Continuous Kilns." This subject, in the hands of Mr. Millar, who has had a great deal of experience in the brick making business, was treated in a very thorough manner.

Thursday evening the members were the guests of the brick manufacturers of Toronto, at a banquet held in the Rossin House. Mr. William Spears, Chairman of the Reception Commitee of the Toronto Association, acted as toastmaster, and among those present were Hon. J. W. St. John, Speaker of the Provincial Legislature; Hon. Dr. Pyne, Minister of Education; Controllers Shaw, Hubbard and Jones; Alderman J. J. Graham, and other gentlemen representing various local associations. Hon. Dr. Pyne in the course of his address intimated that a class in the School of Science for the training of clay workers was a thing of the near future. He had interviewed Professor Galbraith, Principal of the school, who had expressed himself as being only too glad to meet a committee from the Clay Workers Association and discuss the subject.

Friday morning the members were taken for a drive around the city, and in the afternoon a very important session was held. Papers were read by Mr. A. M. Wickens, on "Uses of Exhaust Steam in a Brick Plant," and Mr. H. de Joannis, Chicago, Ill., on "The Retrospect and Prospect of the Industry." Mr. Wm. McCredie, of Lyons, Ont., gave an address on "Down Draft Kilns," and a very interesting paper was read by Mr. Wm. Baillie of La Prairie, Que.

A committee comprising the following members was appointed to confer with Principal Galbraith, of the School of Science, in reference to the establishment of a school of ceramics in connection with the University:

MR. WM. HANCOCK,
A Vice-President of the Canadian Clay Products Manufacturers for 1906.

S. J. Fox, M.P.P., W. McCredie, J. B. Millar, J. S. McCannell, C. H. Bechtel, William Pears, A. W. Wright, J. B. Lochrie, Joseph Russell, William Hancock and H. deJoannis.

The next convention will be held in Ottawa, Ont. The election of officers resulted as follows: President, J. B. Millar, Toronto; First Vice-President, J. S. McCannell, Milton; Second Vice-President, Charles Curtis, Peterboro; Third Vice-President, J. Cornhill, Chatham; Secretary-Treasurer, C. H. Bechtel, Waterloo; Executive Committee, S. J. Fox, M.P.P., Lindsay, Ont.; T. M. Milligan, Harbord, Ont.; Joseph Russell, Toronto; W. McCredie, Lyons, Ont., and David Martin, Thamesville Ont.

The "Question Drawer" was then opened, but owing to the shortage of time was discussed only briefly.

"GROGS" IN BRICK MAKING.*

By Professor Baker, School of Mining, Kingstoo.

I have chosen as the subject of this paper one which I think is of great interest, and also of great importance to clay workers. By "grogs" is meant those substances which are added to strong clays to render them milder and more easily worked. As a rule only one such substance is used by brick makers in this country, and that is sand; but a few others can be used in case sand is scarce, e.g., loam, powdered brick-bats, sawdust, coal screenings, etc. Of course these several grogs have different effects upon the brick or other product to which they have been added, and I wish to discuss briefly a few of the effects of these grogs on our clays in Ontario.

There is a common error among builders and contractors in general concerning the addition of grogs. They believe that the addition of sand or powderod brick to a clay is an adulteration and a detriment to its use as a building material, much as we view the addition of cotton or shoddy to a woollen fabric. This error on the part of brick users, and many brick makers also, is a serious one, for the addition of these grogs is just the reverse of the above. They improve the brick in several ways, as I hope to show you.

Looking at this subject first from the standpoint of the brick maker, you all know well the difficulties that have to be met in working a clay that is too strong or fat, as it is often called. In the first place, such clay is difficult to mine or dig; it sticks to the plows, spades, scrapers or whatever else may be used to dig it. It sticks together so that it can scarcely be picked apart. You all know just how tough a clay bank can be. If, however, there be a certain amount of sand in the clay, it digs so much more easily.

The tempering of a strong, stiff clay is a most difficult thing; it is almost impossible to do it by hand, and if it is done by a pug-mill or other machines, the tough clay will prove a great user of power. About the only way to temper and disintegrate such clay is to dig it in the fall and allow it to lie in a heap over winter, when with frost and wet and dry it will slowly slake and break up to a workable condition. But some of you have not time for this, and should add sand to such clay in your pug-mill, or tempering pit, or to the brick machine itself, if you do not temper in a separate machine.

In the next part of brick making, viz., moulding, sand plays a very important part. It is almost impossible to shift a strong clay from the moulds, such clay will fit the mould so tightly, and it will be so close in grain that it will rub the moulding sand off the moulds and make it almost impossible to shift the brick when made. It is astonishing what an improvement a little sand will make to such a clay in this respect.

In drying either stiff mud or [illegible] and will make [illegible] strong clay will crack and stake, or a dry shell will form, trapping the interior of the brick wet, or the brick will warp and shrink out of shape by unequal drying, and the accompanying air shrinkage. When sand is added it renders the clay leaner or milder; it will not require so much water for moulding, and the grains of sand keep the brick more open, so that the moisture can escape in drying. Again, the sand will not shrink, so that the bricks will keep their shape much better, as only part of the material of which they are made shrinks.

We have seen from the above remarks certain parts of which must describe conditions which all of you have experience in one respect or other [illegible] addition of sand makes clay [illegible] easier in every respect, from the digging of the [illegible] burning of the finished product.

But all that we have said is from the standpoint of the brick maker; but what [illegible] addition of sand mean a poorer article for builder and contractor? This is the other standpoint from which I wish you to study this question.

Two great classes of strains are put upon brick in building; the one is a tensile strength which would tend to pull bricks apart, the other is a pressure which would tend to crush the brick. The second of these is most important, as it is practically the stress to which bricks are subjected in a building, by the weight placed on them. In order to submit clays to some of these tests, I took several of our Ontario clays and subjected them to these tests, as follows: The raw clay with its own 15% of sand was formed into a briquette, then the percentage of sand was increased to 25 and then again to 33%. These briquettes were made about the shape of the figure 8, the narrow part being one inch wide and the whole briquette is one inch thick, so that at the smallest section, that is, at the place where they will naturally break, the cross section would be one square inch. The weight applied was in pounds so that the results were in lbs. per square inch. The briquettes were all burned in the same muffle furnace, so that all three sets of briquettes were subjected to the same conditions in burning.

TABLE OF CLAY TESTS.

Sample.	15% Sand. No. 1.	No. 2.	Aver.	25% Sand. No. 1.	No. 2.	Aver.	33⅓% Sand. No. 1.	No. 2.	Aver.
A	250	210	230	320	365	342	250	265	257
B	290	325	307	380	350	365	270	290	280
C	300	340	320	350	375	362	326	300	313
D	210	185	197	330	350	340	280	295	287
E	235	270	252	295	310	302	200	230	215
			261			342			270

*Lecture delivered before the Association of Canadian Clay Products Manufacturers.

From the above tests we see that the addition of sand to these clays makes them stronger and better able to resist the pulling strains to which they are subjected. We see here that the best results were obtained when the per cent. of sand is 25, whereas 33% is a little too much. This, of course, simply means that you can get too much even of a good thing, and of course there is a proper increase of sand, which seriously overstepped, becomes a detriment instead of the reverse.

The crushing test, or the ability to withstand weight placed upon it, is still more important to brick users, and some tests of these are also of interest. In these tests small cubes were made one inch to an edge, so that the blocks were one cubic inch, and any face was one square inch. Pressure was then placed on this and gradually increased till the cube crushed. Four tests were made on ordinary red face brick, as sold in general for building, and these required an average of 2,460 lbs. to the square inch to crush them. This figure is given as a standard for ordinary stock brick, and for comparison with the tests given below.

TABLE OF CLAY TESTS.

Sample.	15% Sand. No. 1.	No. 2.	Aver.	25% Sand. No. 1.	No. 2.	Aver.	33⅓% Sand. No. 1.	No. 2.	Aver.
A	3150	2820	2985	3190	3390	3290	2640	3060	2850
B	2900	2580	2790	2990	3375	3182	3400	2760	3080
C	2620	2760	2690	3250	3580	3415	3615	2880	3247
D	3480	2844	3162	3640	4370	4005	2510	2640	2575
E	3710	3410	3560	4360	4720	4540	3390	3570	3480
			3047			3686			3046

Here again we see that the addition of sand increases the products. The small blocks were all burned in the one kiln at one time, so that the conditions were uniform for all. The tests show that 25% of sand is again best, while 33% overstepped the limit and the ability to withstand pressure begins to drop again. You will notice also that the average of tests made on the clays having 15% of sand in them, and this by the way is about the average of our Ontario clays, is about the same as the standard of four tests made on ordinary stock brick as sold in general for building purposes, which shows that these tests were about as fair as could be made. We realize of course that many tests must be made before any [illegible] statements can be made, but it [illegible] sufficiently well established when an average of ten tests on [illegible] 15% sand in its [illegible] 3,047 lbs. to the square inch, while ordinary stock brick of commerce made from such clay also gives 2,460 lbs., and that ten tests of clay with the sand content increased to 25% gives an average of 3,686 lbs. per square inch, that the addition of sand to clay is a desirable thing. It seems certain at any rate that the addition of 25% of sand, or one shovel of sand to three shovels of clay, is a decided improvement on strong clays, but this per cent. of sand should not be seriously overstepped or the values drop again.

Do not mistake me to mean that every one of you should add 25% to your clay in working; some of you have a sandy clay already, and no doubt you know it and are pleased with [illegible] to work into brick; others have a strong clay, difficult to handle and a majority of [illegible] have a strong clay difficult to handle and do not hesitate to use sand. It will not hurt the color of your brick unless there be limestone in it, and this is very rarely the case.

If you suspect limestone in your sand, put a little of it into a glass tumblor or a bottle, then pour in a little acid of any kind, and warm it slightly by placing it in a little warm water. If there is any limestone in your sand you will see a brisk effervescence or bubbling coming off the sand. If your clay burns to white brick or buff brick, this will not hurt them, but if your clay burns to red brick, avoid any sand or loam that shows limestone, for this will tend to spoil the color of the brick by making them light in color, or even spotted.

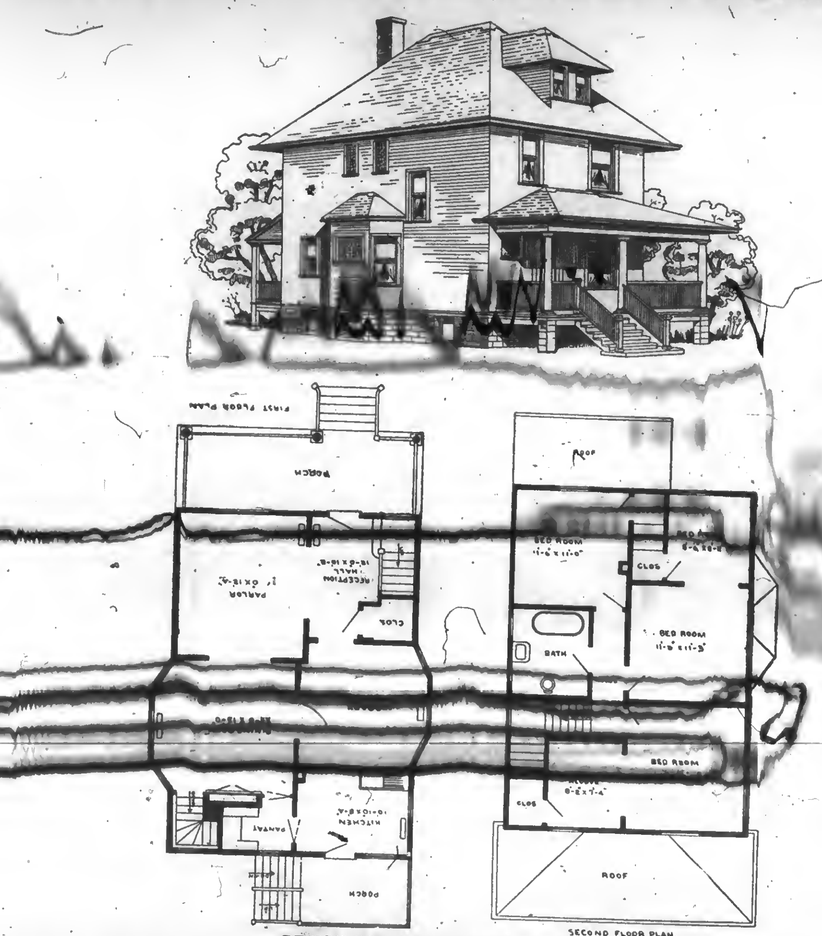
The addition of combustible grogs, e.g., sawdust or coal screenings, is for a different purpose entirely, and this is a subject which has not been considered very much in this country. In Europe such grogs have been used to a considerable extent. Coal, e.g., is powdered and mixed in the raw clay, when the kilns are burned this fine coal dust burns also and helps to distribute the heat throughout the kiln and aids in the burning. The particles of clay fuse slightly and knit to each other, and a more or less porous brick results.

Considerable use is now made of coarser materials as grogs, e.g., coarser coal or sawdust is commonly used. This is used in the manufacture of porous bricks, terra cotta lumber, and fire-proofing.

The aim of the architect and contractor now is to erect a building that will be fireproof and yet not too heavy. This is now accomplished by making the main structure or shape with iron and filling in with terra cotta lumber or fire-proofing. To make this we may use any kind of clay, as the color of the product does not signify, provided it is strong and light. The clay is pugged thoroughly with coarse sawdust, the blocks of any desired shape are made, as in the stiff mud process, by varying the die they are dried like tile, after which they are burned in a down draft kiln. The sawdust soon catches fire, and helps to burn the blocks, and after burning out, the small pores are left, making the blocks quite porous or vesicular, so much so that the blocks are very light and can be used for ceilings, arches, domes, roofs, partitions, etc., or for any of the purposes to which heavier timber would be used. These blocks are so porous that nails, screws, spikes, etc., can be driven into them with about as great ease as into timber. The rough porous blocks serve admirably to plaster onto, so that a building of any shape may be covered by them and plastered over and painted. For this reason most of the interior decoration now seen in large buildings is accomplished in this way.

The discussion of grogs so far has been confined to different substances that are added to the raw material. There is one new use for grogs now which may not be well known to you all. All of you who are working with the ordinary scoved kiln or dutch clamp kiln have experienced the difficulty of burning the brick right to the outside of the kiln. This has been aided in many ways, e.g., by leaving the heads more open in piling, to cause more draft in that part; or again the centre of the kiln may be covered on top by mud, or by asbestos sheets, thereby throwing the draft to the outside around the edges. But a new and much better method may now be used. This consists in placing a row of hard coal screenings, which are cheap, around the edge of the kiln on top. The ridge of hard coal is about 18 inches wide and rounded up like a potato ridge. In setting the kiln the heads are left open as usual, and a row of skintlers are usually placed on the very outside row. After the kiln has burned up considerably in the usual way, and when the heat begins to get up through the heads, the kiln man goes up on top and by the use of a small wedge like a poker he works the brick a little and allows a little of the coal to trickle down into the kiln. This coal takes fire and helps to burn the brick, and at the same time creates an extra draft through the heads, which soon draws more of the kiln fire to those parts. This act should be repeated every hour, letting only a little of the coal trickle down each time, so as not to choke the drafts or cause too much fire in the heads. By this process your kilns can be burned right to the scoving. I have seen them done, and good red face brick shipped from against the scoving. In down draft kilns, of course, the fire can be drawn to any part of the kiln by the use of dampers.

I have confined all my remarks to this one division of clay manufacture, because I am convinced that it is a most important matter to you all, and I am sure it is one that has not received its share of consideration on your part. These are not experiments, they are points that are in use by successful clay workers, and I hope I have been able to arouse your interest in this great department of your work.



DESIGN FOR A MODERATE COST HOUSE.

DESCRIPTION OF DESIGN FOR A MODERATE COST HOUSE.

Frame house of seven rooms, two alcoves and bath. Basement walls are of concrete to grade and cement blocks from grade to first floor. Bath is extra large in size being seven feet and four inches by eight feet and six inches. Main body of house 24 feet wide and 34 feet long. Plain oak to be used for finish of first story except in kitchen and pantries and finish of second story is of red birch. Plain oak floors are provided for first story except in kitchen and bath room. Maple floors are used for balance of house. Building is heated by steam. Estimate cost is $2900.00.

MANITOBA ASSOCIATION OF ARCHITECTS.

The first annual meeting of the Manitoba Association of Architects was held on Friday evening, Nov. 16th. The President's report is printed below, in full. The Secretary's and Treasurer's reports showed everything to be in a very satisfactory condition. The following officers were elected for the ensuing year: Mr. S. F. Peters, President (re-elected); Mr. J. H. G. Russell, First Vice-President; Mr. S. Hooper, Second Vice-President; Mr. L. T. Bristow, Treasurer (re-elected); Mr. Percy Over, Hon. Secretary (re-elected). Directors; Mr. D. Atchinson (re-elected); Mr. Wm. Fingland; Mr. J. Greenfield (re-elected); Mr. William Elliott (re-elected); Mr. J. Woodman.

PRESIDENT'S ADDRESS.

It becomes the pleasant duty of the president of the Manitoba Association of Architects to welcome the members most heartily to this the initiatory annual meeting of the Association. Although not quite six months have elapsed since its formation—and although we have not as yet as large a bona fide membership as has been expected, possibly considering the fact that these six months have been the busiest portion of the year, we may congratulate ourselves on the fact that we have so respectable a number as 30 members in good standing.

A great deal of interest has been manifested by different practising architects from time to time in the formation of the Association, and at the initiatory meetings there were some large attendances.

The formation of the Association is all the more agreeable in view of the many futile efforts put forward in earlier days by those who were practising architects here for the accomplishment of this object. But Winnipeg was after all only a small place then, and now the growth has been—and is going to continue to be—so extensive, that development must take place, as it has already done, in architecture as in other [illegible]

It will be doubtless considered that this is a opportune time to outline shortly the formation of the Association and the work that has been done to date, and also to commence to lay plans for the future.

The inaugural meeting was held on May 25th, 1906, and was the result of several provisional meetings. The first thing done was to pass the Constitution as had been formed by the Advisory Board, and provision was also made for alterations to same; officers and directors were elected, and rules governing competitions and a schedule of fees were also arranged for.

The first regular monthly meeting was opened with a dinner and was attended by 16 members. At this meeting notice of motion was given by Mr. Jas. Chisholm that he would move in amendment to the first clause in "Rules Governing Competitions" that "The proposed cost of building should not be less than $10,000.00.

Mr. Fingland also gave notice of motion that clause 9 be omitted from "Rules Governing Competitions" which provided for all designs to be submitted with a distinguishing mark or pseudonym.

It was considered by the Council that during the hot weather of July and August, and as the Association has not yet secured permanent quarters, that meetings should be adjourned, and the next meeting was held on September the 21st, 1906, which very few attended, and it was decided to try and make the meetings more interesting in a social way, the matter being left with the Council to arrange.

The next and last meeting on October 19th, was attended by 17 members, dinner being the first attraction, and Mr. Turner's interesting and instructive lecture on reinforced concrete followed. The lecture, one might say, was reinforced with very good lantern slide views of this method of construction, and it is hardly necessary to say was most heartily appreciated, and the members dispersed after having spent a most enjoyable and profitable evening at this meeting.

Mr. Fingland's motion with regard to competitions as follows was carried. [illegible] Drawings shall not be given a distinguishing mark or [illegible] but the author's name shall be sent in a [illegible] envelope [illegible]

Although Mr. Chrisholm's notice of motion has not been acted on, the matter of competitions has received the most earnest consideration of the Council, because it was felt that the objection raised at an early meeting of the Association by one of the members—although not favorably considered at the time

—against placing any limit at all on the cost of the buildings to be competed for, had after all a great deal to be said in its favour, and the Council have lately been unanimously of the opinion it would be in the interests of the Association to greatly simplify the rules governing competitions by striking out most of the clauses originally adopted, particularly that one as to the cost of building. It has been felt that if the kind of drawings to be submitted at a competition were regulated by the Association and also the Board of Examiners, that any member of the Association might enter any such competition with the best chances for fair play and expectations that the best design would win. It is therefore advised that the incoming Council will act on these suggestions.

The same object is desirable also with regard to the election of officers and Council of the Association, provision for which in the preparation of the printed matter was omitted by the typesetter and the omission was not discovered till afterwards.

Resolutions have been passed in Council bearing on these points and will also have to be attended to by the incoming Council.

The foregoing is a short resume of the general meetings of the Association to date, and the following will give an idea of the work done by the Council:

In addition to the necessary preparations for the general monthly meetings, the great bulk of which has been most acceptably attended to by our Hon. Secretary, Mr. Over, the Council have had ten meetings, and considering the youth of the organization have dealt with some important cases.

In the first place they were asked by a Citizens' Committee to assist in taking action with regard to the question of municipal ownership of power and light, but the Council decided such matters were entirely outside our domain as an Association.

Secondly: Differences having arisen between some members of the Association as to the etiquette or lack thereof in connection with some pseudo competitions, the Committee were appealed to and exerted their best efforts, and which, while possibly not satisfactory to all concerned, showed a desire at least to be guided by regulations, and evidences of praiseworthy professional action were most gratifying.

Thirdly: Application was received from the Civic Committee for the Association to appoint a representative to act on the Committee in the preparation of a new building by-law for the city of Winnipeg, and the President was appointed to attend to this matter. I may say in regard to this that although about four months have elapsed since this application was made, the Committee have only a few days ago been called together.

Fourth: The matter of preparing a model form of agreemem for building contracts has occupied considerable time, but the Council have not yet been able to fully decide on one—not really having had enough time at their disposal. It would certainly be well for the Association to have a form they could recommend their clients to use, and the new Council should take this matter up to completion at an early date.

Fifth: The Council interviewed Col. Scott, collector of customs, regarding the collection of duty on plans from foreign countries, and in an endeavor to try and have the duty properly collected. It seems that there is a good deal of difficulty in this matter, first, as regards the question of the amount to be collected, and secondly, the plans that are brought in privately are difficult to place. However the Council discovered that if at any time when, if after a building has been erected, it can be proved that the foreign plans have been used, the duty even then can be collected. The enquiry will at least have the effect of stirring the customs up, and it might be well to ask individual members of the Association to be on the look out and inform the Council of any cases they may hear of. The Secretary has also corresponded with the Ontario Association of Architects on this matter. They seem to be having the same trouble down there, and [illegible] Canadians to look out for their rights and interests.

I think I am justified in saying that [illegible] from the fact that outside Associations are taking an interest in our work, having made enquiries by correspondence, particularly with regard to our evening on reinforced concrete.

The Council have also arranged that a list of the names of draughtsmen seeking positions is to be kept on fyle so that

ARCHITECTS!

SPECIFY

LUXFER WINDOW PRISMS

LUXFER SIDEWALK PRISMS

LUXFER FIREPROOF GLASS

GETTING LIGHT INTO A DARK INTERIOR IS OFTEN A HARD MATTER —
LUXFER PRISMS
ARE THE MOST EFFICIENT MEANS OF ADMITTING SUNLIGHT INTO DARK OFFICES, BASEMENTS, ETC.
THE LUXFER PRISM CO., LIMITED, 100 KING ST. WEST, TORONTO.

SPECIFY

MARBLE MOSAIC FLOORS

GLASS MOSAIC WALLS

ART GLASS

Luxfer Prism Company, Limited

100 King Street West, TORONTO

"Standard" FIXTURES IN A PLACE BY THEMSELVES

"Standard" Plate P. 545 Porcelain Enameled "Recess" Design Lavatory, with Slab, Bowl, Overflow, Apron, Back and Ends all in one piece, Nickel-plated "Torrance" pattern Fuller Faucets with China Handles and Indexes, Supply Pipes, Keystone Waste with China Handle and "P" Trap with Waste and Vent to Wall.

Designed for use in alcoves, closets and wardrobes in offices, hotels, and other public buildings.

Our extensive magazine advertising has taught the public to regard "Standard" Porcelain Enameling over Iron as a new and superior method in the manufacture of plumbing equipment. Therefore, in suggesting "Standard" Fixtures for residence or public building you are merely offering the owner what he already considers the best.

Standard Sanitary Mfg. Co. Pittsburgh, Pa., U. S. A.

members requiring such help may avail themselves of the list at any time.

I may also say that the Secretary has corresponded with the Dominion Minister of Public Works relative to the Competition for new Departmental Buildings at Ottawa. There is also I believe to be a competition for the Government Buildings at Regina with whom the Secretary has also corresponded. The members of the Association will be duly notified if any information is received regarding these competitions.

The above then is a brief outline of what the Association has been able to accomplish since its formation, and although a great deal cannot be claimed to have been accomplished, still a good start has been effected, and we can look forward with confidence to the future, when great things may be done—and all will admit that there is a great deal to do.

In the first place active men must be elected to the Council and every effort made to bring in all the charter members possible, the time for whose admission will expire on the 25th inst.

Then a room, or rooms, should be secured as a home for the Association where members could gather daily, and a commencement should also be made towards the formation of a Library. This would doubtless be another important step, which together with arranging for lectures, essays, etc., on different subjects at the regular monthly meetings when possible, would pave the way for still greater expansion and work in the near future, the final accomplishment of which will, without doubt, benefit, as is the intention, not only the Architects themselves, but the entire community. I might say in speaking of this subject that the Secretary has received a reply from Mr. E. C. White in which he states that he will be pleased to favour the Association with a lecture on the Illumination of Buildings, illustrated with special apparatus, at the February meeting. The Secretary has also communicated with Mr. Cambridge, City Electrician, asking him to give a talk on wiring of buildings at a future meeting.

It was suggested at the last Council meeting that the annual meeting be preceded by a formal dinner, but the prevailing feeling was opposed to this, and a 6.30 dinner followed by the business of the annual meeting was decided on, so as to finish at an early hour.

However, I thing it would be in the interests of the Association if during the holidays a formal dinner should be arranged for, followed by a smoker during which we might be favoured with musical and literary selections from artists of at least local reputation, who would give us at least an extra pleasant hour or so.

It would not be right to close this address without stating that all the meetings of the Council have been held in the office of Messrs. Darling & Pearson—who kindly placed it at our disposal—and that the Association is on this account gratefully indebted to that firm.

Allow me to say in closing, that although retiring from the Presidency of the Association, I shall not cease to take an active interest in its progress, and feel certain that we shall not have long to wait before the results will fully justify us for our early efforts in its formation.

CONVENTION OF THE ONTARIO ASSOCIATION OF ARCHITECTS AT OTTAWA.

If sufficient members go down from Toronto it will be possible to procure a private Pullman car. For this reason those who intend to go had better send their names to the Registrar, not later than the 12th of January.

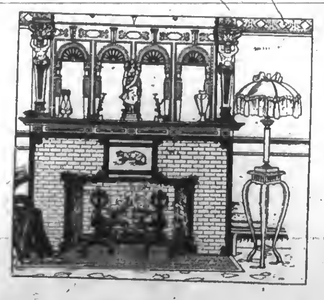
TORONTO'S WATER SUPPLY.

Two or three weeks ago the conduit pipe, through which the water is brought across the Bay from Lake Ontario, was damaged; since that time the water has not been fit to drink. For a time the city was dependent on the Reservoir. One day the Reservoir suddenly became exhausted, and the residents north of Bloor Street were entirely without water for nearly a whole day. Such a condition of things is altogether discreditable to a city of the importance of Toronto or indeed to any city, and, furthermore, is a menace to the property and health of the citizens. In view of the rapid increase of population in the northern part of the city, there is urgent need for a second reservoir of ample dimensions to supply this district.

ARTISTIC FIRE PLACES

Properly Secured with Ornamental Iron Frames
Make a Handsome Finish to Any Room

Fire Dogs
Fenders
Screens
Smoke Guards



Interior Metal Work of Every Kind and Finish.

SEND FOR BULLETIN NO. 20.

CANADA FOUNDRY CO., Limited

Head Office and Works: TORONTO, ONT.

District Offices: Montreal, Halifax, Ottawa, Winnipeg, Vancouver, Rossland

AN END BAY OF READING ROOM ON FIRST FLOOR.

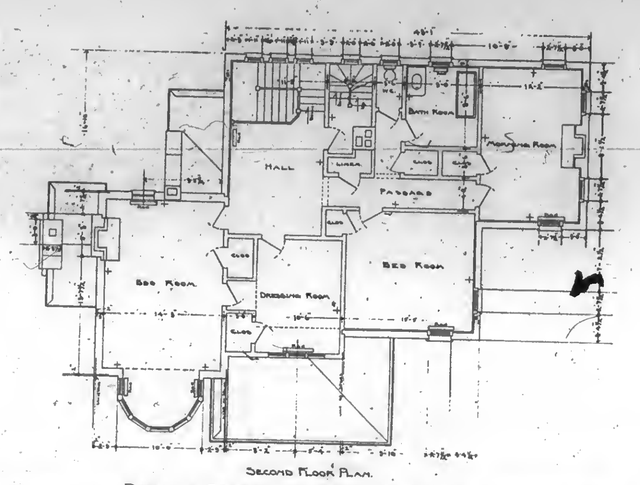
AN END BAY OF READING ROOM ON FIRST FLOOR.

ENTRANCE.

THE McGILL COLLEGE STUDENTS' UNION, MONTREAL.

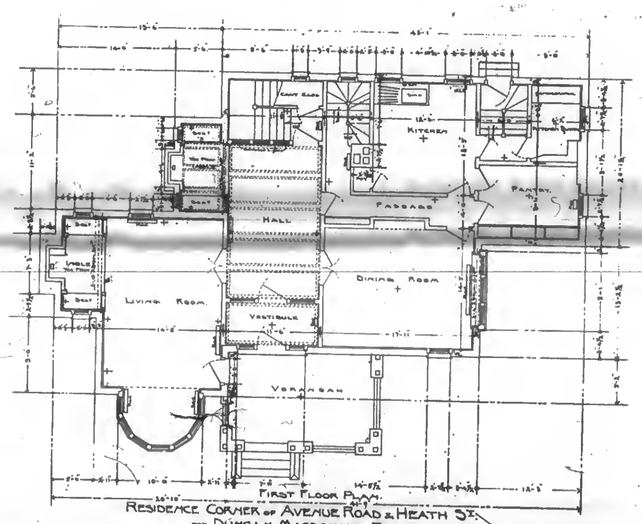
PERCY E. NOBBS, M.A., AND MESSRS. HUTCHISON AND WOOD, MONTREAL, CONJOINT ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1906



SECOND FLOOR PLAN.
RESIDENCE CORNER OF AVENUE ROAD & HEATH ST.
FOR DUNCAN MACDONALD. ESQ.

BOND & SMITH. ARCHTS.
160 BAY ST. TORONTO.



FIRST FLOOR PLAN.
RESIDENCE CORNER OF AVENUE ROAD & HEATH ST.
FOR DUNCAN MACDONALD. ESQ.

SCALE ⅛ INCH = 1 FOOT.

BOND & SMITH. ARCHTS.
160 BAY ST. TORONTO.

FLOOR SPACE PLANS.

HOUSE FOR DUNCAN MACDONALD, ESQ., TORONTO.

MESSRS. BOND AND SMITH, ARCHITECTS, TORONTO.

CANADIAN ARCHITECT AND BUILDER.

VIEW OF NORTH END OF HALL, GROUND FLOOR.

VIEW OF HOUSE SPACE FROM SOUTH-EAST.

HOUSE FOR DUNCAN MACDONALD, ESQ., TORONTO.

MESSRS. BOND AND SMITH, ARCHITECTS, TORONTO.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1906

VESTIBULE.

THE McGILL COLLEGE STUDENTS' UNION, MONTREAL.

PERCY E. NOBBS, M.A., AND MESSRS. HUTCHISON AND WOOD, MONTREAL, CONJOINT ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1908

GROUND FLOOR HALL AND STAIRCASE.

THE McGILL COLLEGE STUDENTS' UNION, MONTREAL.

PERCY E. NOBBS, M.A., AND MESSRS. HUTCHISON AND WOODS, MONTREAL, JOINT ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
DECEMBER, 1908.